RAILROAD GAZETTE

SATURDAY, JULY 3, 1875.

THE MASTER CAR-BUILDERS' ASSOCIATION.

Ninth Annual Convention.

We continue this week our report of the proceedings and debates of the Association at its recent meeting:

After the conclusion of the discussion on ventilation the Secretary's report was read, from which it appeared that out of 197 members on the books, only 61 had paid their assessments for 1874 and 1875.

Mr. HOLMES moved that the subject be referred to the Auditing Committee. Some means ought to be devised to secure the payment of assessments.

Mr. HILDRUP suggested that the Secretary be authorized to draw on members for the amount.

The motion to refer was adopted.

The report of the committee in charge of the rooms of the Association in New York was then read.

The PRESIDENT stated that the rooms were self-supporting, none of the funds of the Association being used for that purpose.

The report was then accepted.

Mr. SMITH then stated that none of the Association's money had as yet been expended on the dictionary of terms. A donation of $100 had been made, which was not yet exhausted.

A long discussion then sprung up as to who were members of the Committee on the Dictionary, which question was finally settled by the passage of a resolution authorizing the President to decide what members of the Association were on the committee.

The PRESIDENT then stated that the Committee on Subjects had recommended that a half hour from each session be devoted to receiving and answering questions to be asked by any member.

The first question was: What is the average expense, at repair shops, of removing worn-out wheels from a car-axle, boring the wheels, refitting the axle, and pressing the new wheels on?

Mr. KIRBY thought the question had been asked to determine what should be the charge made for replacing the wheels under a foreign car. Some roads charged $4, while others thought this too much. He inferred that the question referred only to the change of wheels, not including the turning up of journals.

The PRESIDENT thought it was meant to include turning up the journals when necessary.

Mr. DAVIS (Boston & Lowell) thought that it also included the cost of taking the wheels out from under the car and putting them back.

The PRESIDENT thought that was not included. The wheels had sometimes to be taken out at a long distance from the shop, and the cost varied greatly.

Mr. VAN HOUTEN thought it depended largely upon the facilities for doing the work.

Mr. ROWE (New York Central & Hudson River) had had some experience in this matter and had found that it cost them 75 cents a pair for fitting the wheels, just for material and labor, not counting wear and tear of machinery.

Mr. GRIFFITH thought it was not necessary to get at an average; it was best to make a bill and itemize the charges in each case.

Mr. DAVIS thought it was designed to draw attention to the importance of having proper facilities for doing the work.

The PRESIDENT said that his object in asking the question was to see whether they were keeping details of the cost of their departments. It would not be long before every one would be called upon to keep a detailed account of everything done, and the exact cost of everything. It was a simple question, but required the keeping of detailed accounts to answer it. If answered fully it would show many companies that by keeping in use old, worn-out, antiquated tools they were losing the cost of better machines in a little time.

Mr. ROWE gave the details of the cost in his shop as follows: Time boring two new wheels, 45 minutes; fitting wheel seat, 50 minutes; pressing old wheels off, 25 minutes; pressing new ones on, 30 minutes; in all, 2½ hours. The cost was $1.70, not charging the expense of labor or machinery or for use of tools. There were two men on the press and one on the axle.

A MEMBER said that on his road they had found that they could not bore the wheels to a good fit by running the mandrel through once. They had to run it through twice. They could not turn both journals in the time given. They had a first-class press, and they found that the best they could do was about $1 per pair, and that only when everything was just right.

Mr. CHAMBERLAIN said they had the best tools. The man on the wheel-borer got $1.60 per day, and would bore from 26 to 40 wheels a day; he had gone as high as 60. With a Sellers' lathe on new axles they could turn out 16 axles, or 32 journals 3¼ by 5½. The fitter, who did nothing else, would fit from 40 to 50 axles per day. The whole cost was 65 cents per pair, when axles are turned off.

Mr. ADAMS said that he was on the same road as Mr. Chamberlain, but a different division. It cost him 90 cents a pair to fit up new wheels. Old wheels cost sometimes more, sometimes less. There was the cost of taking them off, but there was less work on the wheel seat. He found much difference of opinion as to the proper charge to make. On some roads where there is much interchange of cars the wheels are quite an item; on others they charge only for the wheels, not for labor. On a road where there was little exchange of cars, they would figure up a big bill which did not always get paid. They wanted to be governed by common custom and not pay such unusual bills. He thought that the cost on old wheels was from 75 cents to $1. To figure closely they must take the old wheels into account, and sometimes they must send a considerable distance to get a broken wheel. Then, with a foreign car, they might not have the right kind of a wheel and would have to send for one.

Mr. LEIGHTON thought the question was asked not so much to know what the cost was, as to find out whether they knew what it was.

Mr. CHAMBERLAIN said that he could give the figures if he had his books. He thought it cost from 75 cents to $1.50 per pair for old wheels.

Mr. LEIGHTON said that Mr. Chamberlain had every advantage. He had the best tools and had them placed just right, and he could hire labor very cheap. He himself could not get a machinist for $1.60 per day.

Mr. CHAMBERLAIN said he would pick out a common laborer who was a little better than the rest and put him on a wheel-borer. In a little time he could do the work very well. In the same way the men on his axle-lathes were not first-class men. They watched these men and saw that their tools were kept in good order.

The next question was: In case of the entire destruction of a car upon any railroad, belonging to any other company, what shall be the basis of settlement—the original cost of the car, or the amount of money that the same car can be built for at the time of settlement?

Mr. ADAMS thought it was fair to take the actual present value of the car. It would not be right to take the original cost in the case of a car built some years ago, when cars cost nearly twice as much as now.

Mr. DAVIS thought the resolution passed some years ago covered that ground.

Mr. VAN HOUTEN said that when they had a case of that kind, the master car-builders of the two roads met and settled on a valuation.

Mr. ADAMS said that the resolution referred to fixed the depreciation at the rate of 10 per cent. a year, but did not fix a basis for the original value.

Mr. VAN HOUTEN believed it was right to take the value of the car at the time of its destruction.

The PRESIDENT thought that was the fair way. They could get at the value by the 10 per cent. depreciation principle.

Mr. VAN HOUTEN said that he had seen cars twelve years in service that had been repaired and were better than others six years old. Four years of one kind of service may injure a car more than ten years of another.

Mr. FORD thought the 10 per cent. depreciation principle rather wild. He had lately had to value a car 15 years old, where that principle would hardly work. The matter was very simple. It was best to take the present cost of a car as the basis.

Mr. SOMERBY said the car was always worth the iron that was in it when it was broken up. They always allowed for the old iron at the present price of iron.

Mr. FORD thought the question reached cases where the car was only damaged, not entirely destroyed.

Mr. WILCOX did not think either principle proposed correct. The car should be valued at its worth at the time, no matter what it cost. They had a list of all their cars and knew what each one was worth. If one was destroyed they made a bill for its value, deducting value of old iron returned. They preferred to build their own cars. They knew the condition of their cars well enough to fix the value pretty closely. If a car was damaged they would charge what it cost to repair it.

Mr. ADAMS thought that car builders would not differ much as to the value of a car or the cost of repairs. The car builders of two roads could generally agree very nearly. With distant roads it is often impossible to send the iron back, because the freight would be more than the iron was worth.

The Convention then adjourned until the next day.

The second day's proceedings were opened by the reading of the report of the Auditing Committee, stating that the accounts of the Secretary and Treasurer were correct.

The Committee on Assessments made a report leaving it to the Convention to fix the amount to be assessed on each member. After some discussion it was fixed at $5, and the Secretary was authorized to draw on each member for the amount.

The report of the Committee on Journals, Bearings and Lubrication (a summary of which has already been given) was then read.

Mr. HOLMES, of the Committee, said that they had not been able to meet as they should, for the reason that the members were located so far apart that they could not come together. Many of the answers received were very imperfect, showing little interest in the matter.

On motion, the Committee was then discharged.

Mr. HOPKINS thought the subject of hot journals a very important one. They are the frequent cause of accidents. In one case, on the Erie, a hot journal caused the loss of $100,000. He thought they were much more frequent than was reported.

Mr. HOLMES said that in the communications received there was some outside information which he did not use in the report, as it was sent in confidence. One instance was told him where a company was using oil costing 19 cents a gallon, and was much troubled with hot boxes. A sample of 30 cent oil was sent them, and it was tried on one side of a car, the 19 cent oil on the other. On that car they had to use four times as much of the cheap oil as of the other. The facts were reported, but the cheap oil continued to be bought.

Mr. HOPKINS knew of a case where a company had tried the experiment, on a certain class of cars, of using the best lard oil in summer and the best sperm oil in winter, and employing an intelligent man to lubricate the cars. They found that the engines would pull 10 per cent. more cars. Using cheap oil and cheap labor was poor policy, besides endangering life.

Mr. ADAMS said that last February, just when he received the circular, he had a new passenger car and he thought he would try an experiment. He measured the oil and weighed the waste carefully, and had kept a close account ever since. He had had no trouble with the journals and the car had run 20,400 miles, 200 miles a day, with 14 gallons of mineral oil and 1¼ pounds of waste. The cost was less than one-third of a mill per mile. It had the standard axle and the Hopkins brass. If one car could do this, others could, with proper care.

Mr. HOPKINS said that with inferior oil more hauling power was necessary, which cost more than the best oil. He had run a Pullman car from Jersey City to Chicago with only half a gill of oil to each box per trip, after the first packing.

Mr. VAN HOUTEN said that there was more trouble with freight cars because they could not receive the same attention as passenger cars. He had tested oil and had run a car 60,000 miles with four ounces of oil to each journal. There was great waste of oil, as could be seen by examining the cars.

Mr. FORD said that close covers to boxes were one cause of hot journals. It took some time and trouble to take them off, and they were neglected in consequence. Another reason is that covers get off altogether and dirt gets in; all lids should be hinged. Another cause is that when journals are hot, brasses are put in that do not fit well. Sometimes the collar of the journal bears too hard on the brass.

Mr. STEINBACH asked whether it was large or small journals that got hot. They used to have much trouble with hot journals. Now they used journals 3½ by 8 inches on passenger cars, 3¾ by 8 on tenders and 3¼ by 8 on coal cars, and they had very little trouble. He knew of but one large journal that had been heated. They fitted the journals with great care. They had had no journals broken since the cold winter of 1867.

Mr. HOPKINS said that the oil he had used in his sleeping car was fine sperm oil.

Mr. STEWART asked about the journals of the standard axles getting hot on cars away from home.

Mr. CHAMBERLAIN said he had had no standard journals hot, either of his own or foreign cars.

Mr. L. GAREY said that this matter has not been sufficiently understood or looked after. It was evident that when heavy loads were carried at high speed over rough joints, the lubricator would be crushed out, causing friction and heating. If more oil was not introduced at once, there was a hot box. If cars were run 12 miles an hour, and the packing was a bed of mud with a little waste mixed in, which will not filter the oil, but lets it lay in the bottom of the box, or run in at one end and out of the other, why should they not have hot boxes? In many cases, inspectors cannot possibly inspect properly the cars passing their station. The time is too short and the labor too great. Very many cars with hot boxes are doctored by the trainmen at a siding and left there, or run to the next station. If a detailed statement was made of oil used and car mileage, the number of hot boxes and broken journals, the number of trains detained and the quantity of oil used by train-men on the road, it would astonish many of them. It was time they had such detailed accounts. He knew one road where, by careful inspection, they had made a saving of 448 barrels of oil in four months.

Mr. STEWART said that one box on a car would get hot, while the others would not. They should try to find the cause in such a case.

Mr. VAN HOUTEN recalled a case where a large sized new passenger engine was started out on an eight-wheeled car with 3½ inch journals. The journals got hot, and the car was sent back to see what was the trouble, the small journals being blamed. He refitted all the brasses, lubricated the boxes himself, started the car out again, and as he had heard nothing more from it, he believed it was all right.

Mr. CHAMBERLAIN said that their journals were perfectly fitted, and they used Hopkins' lead-lined brasses. For a year past he had no record of a hot box on a passenger train.

Mr. STEWART asked whether they had most trouble with large or small journals.

Mr. CHAMBERLAIN said about two-thirds of the hot boxes were small journals. Some time ago he had had much trouble; they tried Babbit-lined boxes, and finally adopted the lead-lined box, and now they had no trouble. Next year he would be prepared with details and notes of the exact wear.

Mr. STEWART said that they could melt the Babbit all out of a box, oil it and have it worn down smooth to the brass. When Babbit begun to heat it made an uneven bearing, but the brass would stay.

Mr. CHAMBERLAIN said the lead lining filled up the imperfections in the journals. They had run 37,000 miles with the lining 1-32 inch thick and had not worn it through.

Mr. HOPKINS said the lead lining differed from Babbit. It was placed over the surface of the bearing and would fill up the uneven spots.

The following question was then asked: In case of a car having been received by a railroad company and no objection made to receiving the car, but after the car has made some distance upon the road the journals get hot, so as to cut and have to be removed, to whose expense should the repairs on the axle be charged?

Mr. CHAMBERLAIN thought that the car master who received it should pay, as it was his carelessness.

Mr. WILCOX thought that the road receiving the car should replace it and pay all damages.

Mr. ADAMS said that they had several cases of that kind on hand now, where other roads held that every one should guarantee its axles, under fair usage.

Another question was then asked, as follows: How many pounds should be allowed for removal from a car-axle in finishing the journals and fitting the wheels of a 4¼ inch wheel seat with a journal 3¼ by 5½ inches; a 4¼ inch wheel seat, journal 3¼ by 6, also 3½ by 7 inches; and a 4½ wheel seat, journal 3¼ by 7 inches, respectively? In other words, how many pounds difference should be allowed between the forged and the finished axles?

The PRESIDENT said that most companies bought their axles and if the forgers left on 25 pounds of iron to be turned off in the lathe, it would be waste.

Mr. CHAMBERLAIN thought it was difficult to find out. Some metal must be left on the axle to get below the sand.

The PRESIDENT said that he had found it vary from 22 to 68 pounds. If 22 pounds was enough they were paying too much when 68 pounds was taken off.

Mr. DAVENPORT said that there was another thing. When they turned off the outside iron, they took off the best of the iron, so that when much had to come off, they were paying for iron, and then had to throw the best away. If they insisted on having axles forged close, it would be done. The manufacturer got more money when the axles were forged large, and it was more difficult to forge them close. Some manufacturers made the axles large purposely. On his road they had been obliged to say that when an axle was over a certain weight, they would not pay for the extra weight. Now they got the axles right along only from 15 to 17 pounds over the finished weight.

Mr. ADAMS said that when he was on the Lake Shore they used to get axles from one forge that did not average over 15 pounds turned off. He thought 25 pounds was a large allowance for the largest axles in use.

Mr. VARNEY said that their new axles, rough, weighed 375 to 378 pounds; finished, 352 or 353 pounds, losing from 22 to 26 pounds.

Mr. C. E. GAREY said he had tried four standard axles, taken at random from a lot of new ones. They weighed 401, 410, 397 and 398 pounds. After fitting they weighed 358, 359, 353 and 355 pounds, a loss in turning of 43, 51, 44 and 43 pounds respectively. He thought 20 pounds was enough.

Mr. PARTRIDGE did not know, but thought that a gentleman had told him that he believed he had got the waste down to 20 pounds per axle.

Mr. OLMSTEAD said that the average weight of the standard axle rough was 374 pounds and when turned 338 pounds, leaving 36 pounds turned off. With a 6 feet 9 inch axle and a 6-inch journal they ran about 346 pounds rough and 321 finished, a loss of 25 pounds.

The Convention then adjourned until the next day.

Peter Cooper's Speech to the Master Mechanics.

During the Wednesday morning session of the late Convention of the Master Mechanics' Association, which was held in the philosophical lecture room of the Cooper Institute, the following interruption of the regular proceedings occurred:

On motion of Mr. BROOKS the discussion (on the report of the Committee on Boilers) was postponed to enable the Convention to hear Mr. Peter Cooper, who was present.

The PRESIDENT.—Gentlemen, I now have the honor of presenting to you Mr. Peter Cooper, of this city. (Applause.)

Mr. COOPER said: Gentlemen, this is something entirely unexpected to me; I had no idea of being called on to speak to you this morning; but since you have called upon me, and this is a very important question that you now have under consideration, I may be able to call your attention to one or two things which may not have been brought within your observation as they have within mine. You see on that shelf a working model of a steam-engine, made entirely of glass. That engine was exhibited before the classes here many times to show the effect of steam in its various operations; and as it was exhibited there was one thing developed which struck me as well worth noticing. The three jars which you see are the boilers which furnish the steam. The steam was generated by the burning of gas below the boilers. When the engine was running regularly I noticed, by accident, that when the man would raise the safety valve and let the steam blow off beyond the supply of the engine, as soon as the safety valve was raised, and while the engine was running, the water would rise in those boilers some two inches up against the side of the boilers. That developed to me one of the dangers in the use of engines which all engineers should be aware of; that whenever they find from any cause that the boiler iron has been exposed to the fire by reason of the water getting too low in the boiler, instead of letting off steam they should close it all right down and even stop the engine, if they can, and open the doors and draw out the fire; this would be safer than to let off steam. By letting off the steam the original water rising up in contact with the heated iron creates such a volume of steam that the safety valve can hardly discharge it sufficiently quick to prevent an explosion. I thought that this fact might not have come to your observation, and as I was unexpectedly called upon to say something, it struck me as one thing that perhaps might be of interest to you. They tried the experiment over and over again with the same result; the water would rise some two inches on the side of the boiler. If the boiler had been sufficiently hot above where the water in ordinary usage is found, then it would have been forced up by reason of the excessive amount of steam generated, and produced an explosion. This fact may be worth remembering

by engineers—that they should be careful in letting off steam, that the water in the boiler should not rise above the place it ordinarily fills.

A gentleman has just asked me to say something about a very little insignificant locomotive which I made, I think in the year 1829. You will see how insignificant it was, when I tell you that the cylinder was only three inches through, with a four inch stroke. It seemed to be presumption to think that such an engine would do anything on a railroad, and especially on a road where there was a grade of 18 feet to the mile and curves of only 250 or 300 feet radius. I had been drawn into a speculation in Baltimore about that time, with two men who represented that they had very large means. We bought together 3,000 acres of land, extending some three miles on the north side of the harbor at Baltimore. After I had been in partnership with them a very little while, and had paid my portion of the purchase money (we bought the whole tract for $105,000), I found that I had paid my part while they had paid nothing, and that I was even then paying their board bills. They proved to be irresponsible men. What to do was the question. I insisted at once that they must either pay up or sell out. I was willing to buy or sell, whichever they chose. They could not buy, and so, of course, after a good deal of bargaining, one man was induced to take $10,000 for his share, and I paid it to him at once. The other, after a while, agreed to go out for a little less, so that after purchasing their interests I had an elephant on my hands and the question was, what should I do with it? I had to leave my business here while attending to this business in Baltimore. When the Baltimore & Ohio Railroad Company started, it started under very high expectations of fortune to all concerned in it. I remember that Mr. Patterson told me that they then thought that the road would be so prodigal in its returns that they could afford to make the rails of silver. That is a very extravagant idea, to be sure, but that is what he said. Instead, however, of accomplishing such a result, they found at the end of one year they had spent their first 5 per cent. of capital and had demonstrated the fact that they must change the location of their road in order to avoid the very short turns, which they had at first adopted in order to save expense. They had learned from their experience as well as from the opinions of competent engineers from England that no road could be successfully run with a locomotive on which were radii of less than 300 feet; and on that road they then had radii of 150 to 200 feet. There were a number of short curves of that kind. The company was plunged in despair and the principal stockholders determined that they would no longer pay up the assessments on their stock. In the abandonment of that road I saw the defeat of my enterprise. It would have been a very terrible defeat to me, for I saw that the growth of the city of Baltimore depended upon the success of that road, and I had purchased that tract with a view of taking advantage of the rapid growth in the city which was anticipated. I saw that my land was likely to remain for a great while before it could be of use, simply because they could not use the locomotives they then had on the road as they had constructed it. I said to the President and to a few of the directors who were principally interested, that if they would hold on and not sacrifice their stock for a little while, I would put a small locomotive on which I thought could pull a train around those short curves. So I got up a little locomotive. I happened to have an engine in my factory. I took that to Baltimore, got some old wheels at the railroad shops and rigged up a temporary locomotive—and I think it was about as temporary as any you ever saw. When I got it ready for an experiment I invited the President and directors to go out on it. I will not go through with all the mishaps and hindrances I met with. I started with an engine that was a new construction altogether. It was a peculiar kind of an engine which I had gotten up for an experiment, and for the purpose of demonstrating a fact which is perhaps worth noticing; and I think the day will come when the principle embodied in that engine will be successfully demonstrated as correct. I got the idea that there was a great loss of power in getting a rotary motion through a crank; and I saw the way to get clear of it. I described the method as well as I could to a young engineer at the Sterling Iron Works (this was more than 50 years ago), and he seemed to understand how to do it. I agreed with him to get me up a little engine, and he did so. When it was done he notified me that it was ready for experiment. I went down to Baltimore to try the experiment, and I got permission to throw off the shackle-bar of a little engine more than twice the size of the one I had. They were boring a steam cylinder with it, and doing nothing else. I got permission to throw that off and put on a boiler that took the power of my little engine. One dropped it and the other took it while the safety valve was balanced exactly; it did not take two minutes to perform the operation. To the astonishment of all who saw it, the little engine took the work. I remember the remarks of an English engineer who was there at the time. He looked at it with astonishment, and then said: "If any man had told me that that engine would do that work, I would have told him that he knew nothing about mechanics. I now see that we will yet cross the ocean in six days." That was fifty years ago, and we have come pretty near his prediction. That engine I took to my factory and pumped water with it. Happening to have it, I took it on to Baltimore and made a locomotive of it. At last I got it all ready to take out of the shop and put on the road. To give you an idea of how it looked, I will describe it in a few words. Just imagine a steam cylinder with a piston rod going entirely through it. Imagine a chain at each end connected with the piston rod and the chain passing around a wheel at the top that was vertical, and another wheel at the bottom. With the piston rod this made the chain endless. Then imagine the chain bolted to the top wheel and bolted to the bottom wheel. Then I put a chain upon the other two wheels and crossed the two chains so that one was loose at the top and one fast at the bottom. When the engine made its stroke it made alternate motions. There was a catch that caught on the edge of the flange. These catches were borne up by a spring behind them, and as it made this motion one way the catch was perfectly free to slip, and the instant it stopped the other catch was ready to take it and carry it on. In this way the rotary motion was kept up about as perfectly as you can imagine. It worked well until the edge of the keys began to wear, and then the hard strain caused it to slip. That discouraged me from making a larger one.

I put this thing on the locomotive. I got it all ready to run on the road. I had a temporary track in the shop on which I could run it backward and forward by way of experiment. While I was away for a little while—after I had got all ready to go out on the road—somebody ran it backward and forward on this temporary track, and not understanding the operation, ran it so hard that they broke a piece right out of the wheel. It was a good deal of trouble to get another, but I did get another, and put it on, got it into the railroad house and started the steam over night, ready to make a start in the morning. The President and two or three gentlemen stepped on to the locomotive and we went out a little way and came back. I felt confident that the next day we would go out with it and have a fair trial. The next day came, but again something had happened to my locomotive. They had been running it backward and forward again and had broken another piece out of my wheel. So I found that I would have to be delayed until I could have another one made. I had another made. I was standing by the man and watching him as he was finishing it off. I thought we would soon be ready for a start. As he was putting the last touches upon it, as bad luck would have it, it slipped out of his hand with the catch on it, and it went around and broke another piece off. Thinks I, the Fates are against me. I took that same little cylinder, put it on a cross-head with a bottom-bar, piston rod, a couple of little shackle-bars, with a crank and cog-wheel, and put the locomotive on the road. When I got all ready, I invited the directors to come and witness the experiment. Just then another little accident happened that I must tell you about. Some good-for-nothing fellow wrung off the copper steam pipes, just for the old copper. I got them fixed, and again invited the directors to come and witness the start. That time we succeeded in getting off. I got 36 persons in one car and hooked on to it. The locomotive carried six men besides its own fuel and water. You would think that so small a cylinder would not be able to do the work, and the boiler was only about as big as a flour barrel—it was a tubular boiler, with iron gun-barrels for the tubes. I feared that I would not be able to get steam enough out of that boiler, and so I put a blower up—such a one as you never saw, I guess. I screwed a crooked joint on to the top of the smoke stack, carried a belt down over a wheel on the shaft and so I got up speed enough to run the blower. I found that I had sufficient power to draw the shavings right through the boiler. I put my blower on and got up the steam. I fixed my safety valve at the amount I wanted to carry, but I found that the steam blew out too fast; the safety valve would discharge the steam so rapidly that I thought all the water would go out of the boiler. I could not alter the safety valves very conveniently, so I put my hand on them and held them down. I knew that the boiler was strong. Insignificant as that little engine was, we made the passage—13 miles—in an hour and 12 minutes, turning all the short turns, and established the fact that a locomotive could be made which could go around those short curves, and that was the thing I set out to do. We came back in 47 minutes. We had it down hill in coming back. Some four years ago I met Mr. Latrobe (then the counsel for that road) in Newport and he asked me if I had received a pamphlet from him. I told him that I believed not. Said he: "Then I will send you one; I was one of your passengers on that trip to Ellicott's Mills, and took particular note of everything that transpired and of every mile we traveled, and of the minutes and seconds we were in doing it." He said that he had been delivering an address before a certain body in Baltimore and had taken the opportunity to describe this trial trip. He sent me the address and it gave me information which I was not aware existed.

I believe that that little engine, insignificant as it was, had a great deal to do in stimulating the people to go on with that railroad, which is now such an honor to the country through which it passes, and in which the whole country may well feel a just pride. But I will not occupy any more of your time. I had no expectation of being called upon to say anything, but willingly give you what little information I am able.

On motion of Mr. GARFIELD a vote of thanks was tendered Mr. Cooper for his kindness in addressing the Convention, and a recess was taken in order that members might have an opportunity of showing their respect to Mr. Cooper.

Extension of the New York Elevated Railroad.

We lay before our readers this week a full-page illustration of the details of the plan adopted by the New York Elevated Railroad Company for the extension of their track to Thirty-sixth street, recently completed, and to which reference is made in the proposals for a further extension (which we published last week) to the Central Park and Grand Central Depot. In general terms, it may be described as a system of plate girders supported upon cluster columns arranged at suitable intervals and firmly secured to blocks of brick masonry placed in the line of the street curb. The girders average 35 feet in length between the blocks, and at the street crossings 45 to 55 feet. They are proportioned to carry a rolling load equivalent in effect to a uniformly distributed weight of 700 pounds per lineal foot of space, which, in addition to the weight of the structure, including the track, does not produce a strain exceeding 10,000 pounds per square inch gross section of the material. The 35-feet girders consist of a web plate 18 inches deep by ⅜ inch thick, to which are riveted four angle irons 3½ by 5 by ⅝ inches, forming together a cross section of 18¾ square inches. In the 45-feet spans the depth of the web is increased to 24 inches for a considerable portion of the distance and the angles to ½ inch thick instead of ⅜ inch. Where the spans were increased to 55 feet, plates 10 inches wide and ½ inch thick are added to the flanges of the section as described above for 45-feet spans. The girders of each span are secured against horizontal vibration by diagonal bracing, composed of 3 by 3 by 5-16-inch angle iron riveted to the upper flanges, and they are held firmly in a vertical plane by cross girders riveted to the web, on a line with the upper and lower arms of the supporting column. These cross girders rest upon and are secured to the arms referred to, and play an important part in distributing uniformly the weight of the structure and its applied load to the four legs of the column. They also tend to resist a longitudinal movement of the entire structure when subjected to the influence of a rapidly moving train. This tendency of all elevated structures to move in the direction of the train is an element in the all-important problem of Rapid Transit, which seems to have been sadly neglected in many of the plans which have been submitted to the public, but it is one which must force itself upon the consideration of those who ignore it in practice.

The ends of the main girders rest upon the cross arms of the column, one end being held fast by suitable bolts to the seat, while the other is allowed to move through the space required for expansion and contraction. The girders of adjoining spans are connected by angle iron splices, riveted to the web on the one side, and having oval bolt-holes on the other.

The column is composed of four legs of cruciform section, placed at the angle of a square having a side of 20 inches at the level of the sidewalk, and tapering to 14 inches at the point of outward curvature, from which they expand to a width sufficient to bring the cross arms directly under the main girder. Here they are connected by two 3½ by 5 by ⅝ inch angles, which also form the seats for the girders, and by diagonal plates 4 by ⅜ inches attached to 2½ by 2½ by ¼ inch angles forming the outward finish. At the point of outward curvature, and at a distance from the curb equal to about the height of the hub of a wagon wheel, cross bracing plates 18 inches deep by ⅜ inch thick are riveted to the legs, thus securing a suitable amount of rigidity in the direction of the track and at right angles to it. The section made use of in the columns required for the spans of 35 feet and under are made up of four angles 3 by 3 by ⅜ inches, placed back to back and riveted at suitable intervals; for the longer spans the angles are ⅝ inch thick. It may be noted that a solid rolled section of the dimensions above given could have been used to advantage if the cost of preparing the rolls had not been material.

The foundations to which the columns are secured consist of a bed-stone 6 inches thick by 6 feet square, a block of brick masonry laid in cement, four feet high and four feet square on top, increasing to 5 feet 4 inches at the bottom, and a bed casting having sockets 20 inches deep corresponding to the section of the legs of the columns, with an allowance of ¼ inch play in all directions, the casting being held in position upon the masonry by four anchor bolts 2 inches diameter, built in from the bed stone.

After the column has been placed in position in the cast sockets, the intervening space is filled with sulphur, and a preparation of iron filings and sal-ammoniac, which forms a permanent cement, and effects a rigid connection between the column and the masonry.

The track consists of steel rails weighing 36 pounds per yard, set to the gauge of 4 feet 8½ inches, pine cross ties four inches square, spaced 17 inches between centers, and timber guard-rails 4 by 7 inches, secured to the ties on the inside of the rails. The height of these guards is such as to permit of two inches play under the bottom of the cars, so that in the event of derailment the cars would slide on the guards before the flanges of the wheels would strike the ties.

Upon the completion of this work the deflections of the several spans under the regular engine and train load was noted and found to be for the 35-feet spans, ⅝ inch, and for the 45-feet spans, ⅞ inch, with little or no lateral motion.

This work was designed and built by Mr. Charles Macdonald, C. E., of No. 52 Wall street, New York, now President of the Delaware Bridge Company.

Wear and Breakage of Iron and Steel.

Committee F of the United States Commission for Testing Iron and Steel have issued the following circular:

STEVENS INSTITUTE OF TECHNOLOGY,
HOBOKEN, N. J.

The board appointed by the President of the United States, under the provisions of an Act of Congress, approved March 3, 1875, "to test iron, steel and other metals," has instructed this Committee to continue an investigation of those modifications of the various properties of the metals which are produced by changes of temperature.

The Committee are desirous of supplementing these experimental researches with such results of other experimental work and of observation as may be obtainable from authentic sources; they, therefore, solicit such contributions from investigators and observers as may be deemed valuable as assisting in the task assigned them.

The behavior of rails and of machinery exposed to the extremes of temperature observed in northern latitudes, where exposed to wear or to breakage, will be likely to afford valuable data. The character of the fracture and the texture of the abraded surfaces, as well as the statistics ordinarily collected, should be noted. Specimens exhibiting peculiarities of behavior or appearance, and photographs of masses which it may not be convenient to forward, will be of value. Where exact quantitative analyses of metals exhibiting unusual characteristics can be given, they will add effectively in the determination of the causes of such peculiarities.

The statistics of well managed railroads are expected to afford useful and reliable information. Rolling mills producing rails and other forms of rolled iron which are tested by the drop may be able to furnish more accurate statements of the effect of changes of temperature in modifying resistance to shocks.

Some experimental work has already been done in this field, and it is desired that the results of such researches may be communicated in as great detail and with as much accuracy as possible. Published monographs, reference to papers published in scientific, engineering or other periodicals, and unpublished papers, will be received as valuable contributions.

All assistance rendered the Committee in the endeavor to ascertain the character of the change of the force of cohesion produced in the metals and their alloys by variation of temperature, to determine the mathematical expression of that law, and to obtain such formulas, either exact or approximate, as will make these results conveniently and practically available to engineers and constructors, will be properly acknowledged.

R. H. THURSTON, *Chairman.*

Mann's Sleeping Coaches.

The London *Engineer* says:

"An experimental trial trip from London to Cambridge and back has been made on the Great Northern Railway, in order to test the performance of one of Mann's boudoir sleeping cars, described by the proprietors as a new design of a carriage of luxury for the public. We have already mentioned the fact of these cars being used on the Paris-Vienna line. The car, which fully justifies by the perfection of its fittings, the term a 'carriage of luxury,' is 30 feet long, and differs from the Pullman sleeping cars in two chief characteristics; first, that instead of having one large room, it is divided into four small compartments or boudoirs; second, that its beds are placed transversely to the line of railway. Two of the compartments make up four beds each, and the remaining two two beds each; and they are perfectly inclosed and secluded on all sides. During the daytime the same compartments will afford seats for 18 passengers. The cars are fitted up with lavatories for ladies and gentlemen, and an attendant travels with each, and can be summoned by a bell from each bed. In the beauty and finish of its appointments the car is quite equal to those of the Pullman Company, and it possesses one special convenience which is worthy of note. This is a set of small steps in each compartment, so arranged that they form the support of a table which can be unshipped and laid aside, and then they assist passengers to mount into the upper sleeping berths. When they were first introduced, although the comfort of their sleeping berths was much appreciated, we heard complaints of the oscillation due to a rigid wheel base for so long a carriage. In the car tried lately this oscillation was overcome by giving some lateral play to the wheels, and the traveling was admirable in its steadiness. The journey of 59 miles to Cambridge was made in 1 hour 27 minutes, and the maximum speed attained was at the rate of 60 miles an hour. The car is not of the newest pattern, and its weight—14 tons—exceeds by 3½ tons that of some which are now running on the Continent, and which afford equal accommodation for the same number of passengers. The compartments are lighted with the new railway lamps of the Silber Light Company, which will afford to the occupants light enough for reading or pursuing other occupations, and which can be screened when the time comes for retiring to rest. In thus following the good example set by the Midland, the Great Northern Company deserves the thanks of all who make long journeys by it; and as soon as the car comes into general use on the line, it will be possible to go to bed between King's-Cross and Peterborough, and to wake refreshed at Edinburgh or at Perth."

ELEVATION with SECTION

36 ft. 35 ft. 40 ft.

Section AB.

Section CD

E F

H K

D

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Scale for general plans.

Scale for details.

Section L M

Section E F

Section H K

PLAN with SECTION

RAILROAD GAZETTE

Published Every Saturday.

CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

CONTENTS.

Editorial Announcements.

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

THE CENTENNIAL.

As we write, the indications of the thermometer, premonitory discharges of fire-crackers, and the prophetic calendar, all announce the advent of the Fourth of July. Quite naturally, therefore, the 99th anniversary of this year leads us to think of the Centennial of next, and the national celebration which the good people of Philadelphia are preparing for with so much energy.

In a leading article published in our able cotemporary, the London *Engineer* of April 23, the engineers of Great Britain were advised very strongly *not* to exhibit their productions at Philadelphia, because, to quote its language, "in the fact that a prohibitive American tariff intercepts the course of trade between the two countries lies the reason for which we assert that English exhibitors can secure no possible benefit of any kind by sending their productions to Philadelphia," and, "if we exhibit at Philadelphia we shall at once provide Brother Jonathan the means of instruction of which he will not be slow to avail himself."

Now if the latter doctrine should prevail and the people of one country should refuse to exhibit their productions in another because by doing so they would be giving information to their competitors in business, then, obviously, international exhibitions must cease. If the reason for withholding such information is a good one, it may be applied to different sections of the same country, and finally to neighbors of the same section, until at last it would lead to the concealment of all the information which has been gained by study, investigation and experience. This course was pursued by the tradesmen of the middle and even later ages, but we thought the principle was being abandoned before the advance of intelligence, and by all enlightened communities and individuals excepting, perhaps, some of the members of the American Society of Civil Engineers. If the real motive for holding exhibitions is to "develop the progress of arts and manufactures,"—which our contempory says is only the ostensible and not the actual motive—then the nations which participate will have much to gain whether the country in which such an exhibition is held has or has not a protective tariff. If one nation is deterred from participating in such an exhibition for fear that she might, if she sent her productions there, be contributing knowledge to her competitors which the latter could use to the disadvantage of the first, then, of course, international exhibitions must be abandoned as "a means of instruction;" but even if we do that, and accept the *Engineer's* assertion that "international or provincial exhibitions are simply great bazars, in which space is taken and to which goods are sent, either to effect sales or to serve as advertisements" it is even then not certain that foreigners should be deterred from exhibiting in a country which believes and practices the protective system. We do not care to discuss here whether a protective tariff is just or unjust, wise or unwise, but would rather consider whether it would be advantageous or disadvantageous for foreign producers, in a country in which trade is unrestricted, to exhibit their productions in ours, where a heavy impost duty is imposed. Every skillful salesman knows that, even though a person has determined in his own mind not to trade with the firm represented by the former, yet it is always best to show the disinclined buyer the goods which are offered for sale. Now, at the present time this country occupies the relation to foreign countries of a party determined not to buy their productions. Should they be exhibited, however, it might have the effect which showing goods so often has on merchants who are determined not to buy; that is, it might be found that we need what is shown to us, the value and use of which was possibly not known before.

Probably nothing could show so forcibly to the people of this country the difference in the cost of various commodities, due to our protective tariff, as an exhibition of foreign goods, marked with the prices at which they could be sold, with and without the duties which are imposed. If in addition the price at the place of production, and the cost of freight to Philadelphia were given, it would furnish the data for making an exact comparison of the cost of our own with that of foreign productions.

The advantage to be derived from international and other similar exhibitions, we believe, is not clearly described by the general phrase, "the development of the progress of arts and manufactures;" nor are they *merely* "bazars to which goods are sent either to effect sales or to serve as advertisements." In a certain sense, it is true, they fulfill both of these purposes, but, besides this, they have the effect of disseminating knowledge concerning the advance of the arts and sciences, in a way which is hardly possible by any other instrumentality. Society is now united by such extremely complex relations that it is impossible to anticipate what the effect is or will be of spreading information broadcast in the world. One industry always fosters another, as has been shown over and over again by the introduction of labor-saving machinery, new inventions and processes. Even if there were no religion in the world, the laws of political economy would prove that one nation or people is not benefited but ultimately injured by the misfortunes of another. As the different parts of the world become more and more closely united by modern intercourse and facilities of travel this becomes more and more clear, and it seems as though civilization must soon bind together the whole human race in one common brotherhood. Without making any attempt at millennial prognostications, there can be no doubt of the fact that the development or increase of the productive capacity of our nation makes itself felt in others. If the productions of Europe are so increased in price that they can be enjoyed more cheaply by going to them instead of bringing them here, then the part of Mahomet and the mountain will be re-enacted by hundreds and thousands of our people, as has been the case this year to a greater extent than ever before, by those who have been and are visiting Europe.

It is remarkable, too, how the wants of one portion of mankind manifest themselves simultaneously with the capacity of another to supply them. Show an American bridge builder a hydraulic riveting machine, and he will at once discover how much he needs one; or exhibit a steam-plow to a prairie farmer, and he would at once begin to calculate the work it would do and the money he would save by its use. But while our cotemporary would doubtless admit this, it would probably be said in reply, that while the exhibition of English machinery might excite such a demand that the manufacturers of it would derive no benefit, but would simply be "providing the means of instruction to Brother Jonathan, of which he would not be slow to avail himself." Now we of course cannot say that this would not be the case; it probably would be, but if our cotemporary assumes that this would be the *only* result of exhibiting machinery here, we say that it is absolutely impossible to foresee that such would be the case. Let foreign nations bring their productions here and offer them at the prices at which they can be sold, so that the whole country may know, and thus be able to determine whether it is wise or unwise to exclude them from our markets. It is more than probable, too, that if the productions of other countries are exhibited here that the demands due to the great natural resources of this, will find new uses for many things sent here, which at present neither the producer nor the future consumer can anticipate. Every manufacturer knows the difficulty of making the character of his productions known, or of "introducing" a new article or material. A very entertaining essay has been written on "the capacity of the human mind to resist knowledge," and people accustomed to studious habits are quite sure to exaggerate the efficiency of books and papers as a means of conveying knowledge. It is because their instrumentality is not required in an international exhibition, that it is quite certain to be more effective, and to produce more distinct and lasting impressions than any other form of instruction can.

As all previous international exhibitions have been held in Europe, it has only been those Americans who could afford the expense of a journey across the Atlantic who visited them. Their effect, therefore, upon our people was quite limited. The conditions under which the Centennial will be held will be quite different. It will be near home, so that its influence will reach every community throughout the length and breadth of the land. It will, therefore, have the effect of making the character of the objects exhibited generally known to all our people, and in that respect may and doubtless will have the effect of creating a demand for many things, the qualities and uses of which are now unknown.

In all preceding international exhibitions of this kind held in Europe, railroad equipment, tools, machinery and material have formed a very important part. Owing, however, to the distance from this country, and to the bulk, weight and consequent expense attending the shipment of rolling stock to Europe, there was not anything like a representative exhibition of American railroad equipment at either London, Paris or Vienna. The Centennial, therefore, not only affords an opportunity of exhibiting a representative collection of American railroad equipment, but it is practically *the only* opportunity of this kind which has ever been offered to Americans. It is, therefore, very desirable that there should be a very complete representation of our American system, which differs so much in many respects from that in use in other parts of the world. The value of such an exhibition would, of course, be very much increased if there could be a good representation of rolling stock used on foreign railroads, so that a comparison could be made between ours and that which comes from abroad, but the reasons which we have already stated, even if there were no other, will probably prevent the shipment of locomotives and cars to this country which are intended for exhibition only. In this department then, the exhibition will, we think, be almost exclusively American. The facilities of shipment of all kinds of rolling stock to the exhibition grounds and buildings are so good that there will be very little expense incurred by any manufacturer or railroad company in sending either locomotives or cars.

In locomotives alone, the manufacturers engaged in that business could make a truly magnificent show if each one of them did no more than send one or more specimens of their work. Besides these private firms, many railroad companies also manufacture locomotives for their own lines, and could very easily, between now and next Summer, build what might be called a Centennial locomotive, for the exhibition next year. The same thing may be said of cars. If manufacturers and railroad companies would send specimens of ordinary passenger, drawing-room, sleeping, restaurant, smoking, baggage, postal, and express cars, it would be made an exhibition which has never been equalled. Specimens of cars for carrying freight would not be of any less interest, if they represented all classes of box, platform, coal, ore, oil, cattle, milk, fruit, refrigerator, wrecking and other cars. Such an exhibition would do more to make the American system of operating railroads known to foreigners than anything else could, and would also be of great benefit to Americans in making comparisons of the rolling stock used on one road with that used on others. Of course, if an exhibition of freight cars was at all full and complete, it would occupy a large amount of space, but it would not be at all necessary that freight cars should be placed under cover, and the liberal amount of side track which has been provided outside of the Centennial buildings would be available for such an exhibition. Probably no branch of American manufactures would have so much interest to foreign railroad engineers, as an exhibition of our cast iron car wheels, if they were shown in such a way as to indicate their peculiar character and methods of manufacture. The ores from which the iron is made, the iron in the pig, the chill in which the wheel is cast and wheels in section and complete, with specimens which have not been used and others after long service, would afford all railroad men, whether foreign or native, an opportunity of studying this much discussed subject in a way which would be extremely interesting and instructive. Axles, journal-bearings and boxes, car-couplers and hundreds of other things would all add to the interest of such an exhibition, if those in charge of it would exercise an intelligent discrimination and exclude what was crude and impracticable.

The road department could also supply much that would be of interest, such as rails, rail-joints, switches, frogs, crossings, targets, signals and models of bridges, culverts, tools, surveying instruments, etc. Drawings showing cross sections of track, which are employed with various kinds of ballast, on different roads and in different localities, would also be very instructive.

There will, probably, be a much more complete display

of European manufactured material, such as rails, tires, axles, boiler-plate, etc., than of rolling stock and machinery, because the freight and expense attending the exhibition of these will be much less than that which would be incurred with the former, and also because many manufacturers of such material are represented in this country by agents, who will, of course, be interested in exhibiting the merchandise they sell.

In the department of tools and shop equipment, our American manufacturers will, of course, have a very full display. Its usefulness and value would be very much increased if there could be a large representation of the productions of foreign engineers; but even without any such display, if American manufacturers are fully represented, it will be an exhibition of very great interest.

We are unable, as we write, to say what arrangements have been made for systematizing or encouraging manufacturers and railroad companies to prepare suitable objects for exhibition. Doubtless, "The Department of the Railroad" will be put under the direction of some skillful person or commission. We will not stop to consider whether railroad companies should or will be stirred with any patriotic feelings, but will take for granted that they will do what they can to make this national festival successful, so that it will be more than "simply a great bazar," but will make it "a great school," in which "will be taught" at least a knowledge of our American railroad system, and in which we will all learn whatever other nations and people may be willing to communicate.

AMERICAN IRON PRODUCTION.

Although iron manufactures in this country are of vastly less importance to the transportation interests than the same manufactures in England, they are yet of great and to some lines of the first importance. Great Britain, with less than a quarter of the railroad mileage of the United States, makes two-and-a-third times as much pig iron, and thus has about ten times as much iron per mile of road; but the iron manufacture has a decided influence on transportation in this country in ways not always obvious.

For instance, the great depression in lake traffic, and the ruinously low prices at which grain is carried eastward from Lake Michigan to Buffalo and Oswego, are partly, perhaps largely, due to the stagnation in the iron business. There is little demand for pig iron, and consequently little demand for ore, and the considerable fleet which formerly carried Lake Superior ore to the lower lake ports finds its proper occupation gone, or greatly restricted, and so is become a competitor for the grain traffic. This reflects on the railroads, which keep up their proportion of grain transportation, it is true, and rather exceed it, but do so at rates which probably net a loss to the carriers. Thus not only the two Lake Superior railroads, whose traffic is chiefly ore, but all the trunk lines from the Mississippi valley to the sea-board, which carry no ore and not much pig, are materially injured by the depression in iron production, as of course are all the railroads in the iron-smelting districts and in the districts which supply coal for iron smelting.

Although iron manufactures were almost the first branch of business to suffer from the panic of the fall of 1873, the decrease in production was not really large until the current calendar year. This is contrary to the prevailing impression, but the statistics collected by the American Iron and Steel Association, and recently published in its *Bulletin*, show this distinctly. The production of the past three years has been:

1872.....2,854,558 tons.
1873.....2,868,278 tons.
1874.....2,689,413 tons.

Thus the production of 1874, when iron industry and iron smelting especially, were considered prostrate, was but 178,865 tons, or 6¼ per cent. less than in 1873, when the production was the largest ever known, following, as it did, and being partially within, a period of the most urgent demand, highest prices and most enormous profits. Certainly it does not look as if that business could have been quite prostrated which reduced its greatest production but one-sixteenth in the year of its greatest depression.

But on examination this slight backward movement is explained. For years before, as we know, iron manufactures in this country were making great strides forward. Profits were great, even under unfavorable circumstances, and there was every inducement to put up new furnaces and increase production to the greatest possible extent. At the close of the last four years the number of blast furnaces in the country has been:

1871.....574
1872.....615
1873.....665
1874.....701

A blast furnace is not built in a day. It requires a large capital, usually a combination of capitalists, and a considerable period for construction. Thus the great impulse of the previous years was having its greatest effect in increasing the facilities for production just about 1873, when the panic came. Thus in 1872, when profits were great, 39 furnaces were added to the number in the country; in 1873, during much of which business was depressed, while during its last quarter it was difficult to sell iron on any terms, the number of new furnaces was 50, and in 1874, when the dullness had become almost an old story, it was no less than 36. Moreover the new furnaces are vastly more productive than the average old ones. In these last years the largest furnaces in the country have been built, and the increase in the capacity of blast furnaces for producing pig iron has been much greater than in proportion to the increase of their number.

The impulse given to this business is something like the momentum of an inanimate body; it continues moving forward after the motive power has been withdrawn. The motive for increasing furnace capacity ceased in 1873, but it had already started many enterprises which have been completed since, and from the 1st of January, 1873, to the beginning of this year there has been, we see, an increase of one-sixth in the number of furnaces; a much larger one in their capacity.

The *Bulletin* of the American Iron and Steel Association reports the statistics of the blast furnaces for the last three years, as follows:

Year.	No. of furnaces Jan. 1.	No. of furnaces built during the year.	Total number of furnaces Dec. 31.	Out of blast Dec. 31.	In blast Dec. 31.	Production of pig iron in net tons.
1872	574*	41	615	115†	500	2,854,558
1873	615	50	665	252	413	2,868,278
1874	665‡	38	701	336	365	2,689,413

* Including three spiegeleisen furnaces in New Jersey.
† Two furnaces were abandoned in 1874.
‡ Estimated.

Now if we take the mean between the numbers of furnaces in blast at the beginning and the end of the year as the average number in blast, the average production of each furnace each year was:

1872.....6,166 tons.
1873.....6,290 tons.
1874.....6,914 tons.

If these figures represent the average capacity of the furnaces out of blast as well as in blast, then the total capacity of American furnaces increased from about 3,500,000 tons at the beginning of 1872 to 4,800,000 at the beginning of 1875, or 37 per cent. These figures, however, doubtless exaggerate both capacity and increase, for the smaller furnaces are usually the less profitable, and so likely to go out of blast soonest when trade becomes dull; while the difference in average capacity between those in and out of blast has largely increased within a few years, by the extraordinary capacity of many of the new furnaces.

But the capacity of the furnaces may be much less than these figures and yet much more than equal any present or probable consumption in this country. This latter has not been easily ascertainable, but recently the *Bulletin* of the American Iron and Steel Association has given a statement of the total consumption of pig iron in the United States, as indicated by the Association's statistics, which include pretty accurate reports of imports and production, and more imperfect ones of stocks on hand at the beginning and end of each year. It is as follows, the quantities being in net tons:

Pig Iron.	1872.	1873.	1874.
On hand Jan. 1	400,000	700,000	700,000
Imports	295,967	154,708	61,165
Production	2,854,558	2,868,278	2,689,413
Total supply	3,555,525	2,722,986	3,450,578
On hand Dec. 31	700,000	700,000	1,000,000
Consumption	2,850,525	3,022,986	2,450,578

We may conclude from this that there are now furnaces enough in this country to supply any probable demand for some years to come without any future importations. A corollary of this is that, so long as prices enable the most unfavorably situated of these furnaces to make any profit, however small, the home demand will, substantially, be supplied by the home production (except in special brands, in which there will doubtless continue to be importations long after America has become a large exporter of pig iron).

Of course the maintenance of prices at a point which will make production generally profitable depends on circumstances not easily foreseen. One of these, and perhaps the most important, is the ability of English iron masters to reduce the price still further, and another the American tariff. We know, however, that prices are now extremely low in England, and that English manufacturers complain that the business is unprofitable, and yet our American works virtually command the American market. Great Britain must be able to offer its iron in our market at still lower prices in order to share our trade again. If the prices of labor and coal can be reduced in that country it will be able to do this; but they have already been reduced largely, and it does not seem probable that any future reductions can be considerable, though the extremely low prices of breadstuffs, if continued another year, of which there is a probability, favor some reduction. Still, we see that the entrance of British iron into this market, now that American furnaces are more than able to supply it, fully means simply the absolute abandonment of a corresponding number of American furnaces, and this, we may be sure, will not occur without a struggle.

It seems probable, therefore, that henceforth the American furnaces will practically supply the home demand for pig iron; and we think that our railroad companies should act upon that assumption. There has been hardly a doubt for many years past that this country would ultimately become a great iron producer and probably a great iron exporter, but then it is only the close approach of such a time that justifies iron masters and carriers in making preparations for the coming business. There is hardly any business which requires so indispensably the cheapest possible transportation, and perhaps no other which affords so large a bulk of traffic in proportion to the value of the product. Ore, coal and limestone must in some way be got together before the pig is produced, and then the product must be distributed. Usually great economy can be secured by a proper distribution of the furnaces, so that the cars carrying ore to our furnaces at the coal mines may carry back coal to another furnace at other ore banks, and often the difference between a profitable and an unprofitable result at the furnaces will depend upon taking advantage of the current of traffic on the railroad or water route, so as to utilize the cars or vessels which would otherwise return empty.

In this country ores are carried enormous distances, practicable only when the cheapest water carriage is afforded. The Lake Superior ores, for instance, are used very largely in Pittsburgh furnaces, and the water routes favor the cheap distribution of this ore in the newer as well as the older iron districts. The Illinois & Michigan Canal, for instance, and the Illinois River, afford an outlet by which this ore can be brought nearly to the mouth of the coal mine at half-a-dozen places in Illinois, and to all the manufacturing centers about St. Louis. And the railroad companies are always favored when such a route enables fuel and ore to be brought together at points on their lines at rates which the railroads cannot afford; for iron manufactures of any kind create a large miscellaneous traffic which the railroads are sure to get, besides the heavy freights in the manufactured article, of which they have the most.

The Railroad Manuals.

Poor's Manual of the Railroads of the United States is now out, but has reached us too late for any extended examination this week. It is in the usual form and finish, has 844 pages, or 20 more than last year, and the introduction (part of which we published from advanced sheets last week) contains, as the last two volumes have done, a very full and interesting summary of the condition and operation of the roads whose statistics are recorded in detail in the body of the book. A hasty glance through the index shows only that some of the new companies, which were omitted last year, are now included, and that some of the newer Canadian roads are also included.

The American Railroad Manual Company, publisher of Vernon's Manual, desires it to be known that, owing to the protracted absence of Mr. Vernon in Europe, where he has been for some time engaged in some extended financial negotiations, it has been deemed best to postpone for a time the publication of volume 3 of the American Railroad Manual, for which all the preparations and collections of statistics have been made. A compensation for the delay will be found in the fact that the time will be utilized in bringing the statistics of the year up to a later date and in making additions, which will, it is hoped, add to the value of the book, while preserving its continuity.

Record of New Railroad Construction.

This number of the *Railroad Gazette* has information of the laying of track on new lines as follows:

Southern Pacific.—The track of the *Los Angeles Division* is extended from Spadra, Cal., southeast 12 miles.

Texas Western.—The track is laid for 6 miles westward from Houston, Texas.

Pueblo & Arkansas Valley.—The track is laid for 6⅛ miles west from Granada, Col., the terminus of the Atchison, Topeka & Santa Fe, of which the new road is an extension.

This is a total of 24⅛ miles of new road, making 336 miles completed in the United States in 1875, against 603 miles reported for the same period in 1874, and 1,387 miles in 1873.

THE CHICAGO, ROCK ISLAND & PACIFIC REPORT for the year ending with March, shows an increase of 4.8 per cent. in earnings, with a decrease of 4.4 per cent. in working expenses, which, however, is almost all absorbed by a very large increase in taxes paid, the expenses and taxes together showing a decrease of 0.5 per cent. only. The net earnings have increased 11.4 per cent. The increase of 4.8 per cent., in earnings has been made on an increase of 11.4 per cent. in passenger mileage and of 15.4 per cent. in tonnage mileage. This increase in traffic, however, has been carried with an increase of only 3.8 per cent. in the train mileage. The gradual decrease of rates of the last few years has been continued, but at a slightly greater rate. The average rate per passenger per mile showed a decrease of 9.8 per cent. from the preceding year, and the rate per ton per mile a decrease of 7.2 per cent. For the past six years the decrease in the passenger rate has been 33.3, and in the tonnage rate 29.9 per cent., there having been more or less decrease in every year of the six. In other respects, the report shows little change from the last. The average number of employes on the road was 3,839, the largest number in any month being 4,048 in June, and the smallest 3,556 in December, and the average monthly

pay-roll being $166,752. This year, as heretofore, no account is given of the earnings or expenses of the leased Chicago & Southwestern road, the only information being containcd in the balance sheet, in the two items of $1,088,840, advances for expenditures, and $1,269,712, advances to pay coupons of Chicago & Southwestern Company.

THE RAILROAD WAR, if current reports are to be believed, is hardly yet at an end, at least so far as to permit of any new adjustment of rates. The Pennsylvania and the Baltimore & Ohio have settled their differences fer the present, but it is said that the Northern trunk lines object, naturally enough, to any attempt to fix upon rates without their consent. The Michigan Central and the New York Central put their veto upon a proposed passenger fare of $22 from New York to Chicago, and other differences from been talked about, though nothing very serious has as yet been made public. There is talk, too, of a fresh outbreak of competition between the Canadian lines, the Grand Trunk and the Great Western, which neither could well afford. The general feeling seems to be that matters are in a somewhat unsettled state but that no very serious trouble between the competing lines is to be expected for a time, at any rate.

NEW PUBLICATIONS.

Cincinnati Industrial Exposition of Manufactures, Products, and the Arts. Rules and Premium List of the Sixth Exposition, 1875.

Report of the Board of Commissioners, Fifth Cincinnati Industrial Exposition, 1874.—In these pamphlets we have a record of the last and a prospectus of the next exposition at Cincinnati. These expositions have met with great success from the outset, and though the country is now full of anticipation of the glories of the "Centennial," so that ordinary expectations can hope to excite little public enthusiasm, we are inclined to think that the one to be held at Cincinnati, from September 8 to October 9 of the present year, will justify the expectations of its projectors that it will be more brilliant than any of its predecessors. A glance at the contents of the prospectus and report under consideration is sufficient to show why these expositions at Cincinnati have achieved a success beyond their numerous competitors in other localities. In the first place, if we may judge rom the financial report, they are undertaken for the purpose of encouraging manufactures and the arts, and with no idea of urning them into mere money-making shows. Their management, also, made up as it is of members of the Board of Trade, the Chamber of Commerce, and the Ohio Mechanics' Institute, s in itself a guarantee of fair and liberal dealing. The premium list, moreover, offers inducements to exhibitors, containing, in addition to a liberal allowance of medals of gold, silver and bronze, cash prizes amounting to nearly $6,000, of which more than $2,000 is in gold. Among the rules we notice one which will doubtless be satisfactory to successful competitors, at least, by which the jurors, as soon as they have made an award in regard to any article, are to place upon it a badge which shall record the fact. In the report of the last exposition are records of several very interesting tests, the first of which, a trial of two automatic cut-off engines, is given in considerable detail. This trial seems to have been made with great care, and the record of operations and results is so full that it is easy for any one to check the jurors' work. Did space permit, we would be glad to review this trial at some length, as it possesses many features of great interest to engineers. We might feel inclined, perhaps, to criticise some of the methods employed, both in making the trial and calculating the results —especially the neglect to test the quality of the steam furnished by the boilers, and to measure the steam used by the jacket of one of the engines. The most interesting and novel test recorded is that of the performance of circular saws, and the power required to drive them. Here, too, a fuller account of the method of making the trials, and a more complete record of the data might have been better, but the account, as given, is interesting and instructive. The principal saw manufacturers were represented at the trial. The importance of tests of this character, both to manufacturers and the general public, is very great, and careful records thereof are always of much interest.

The General Railroad Laws of Michigan have been issued in a pamphlet of 82 pages, compiled in the office of the State Commissioner of Railroads. The amendments made by the Legislature at its last session have been added to the previous compilation, not, as is too often done, in the form of an appendix making double references necessary, but they have been embodied in the body of the laws. A preface calls special attention to these amendments. There are ample marginal notes and a complete index, making it very convenient for reference. Mr. Cobb, the State Commissioner, has also issued a little pamphlet of seven pages, containing in a separate form the *Laws of the State of Michigan Relating to the Duties and Liabilities of Railroad Employes*, which, we presume, is designed for distribution among the class specially interested. Among the railroad employes there is often too much ignorance of the laws specially governing them in their duties, which, no doubt, arises largely from the fact that those laws are published in a form not easily accessible to them, and that no special pains are taken to instruct them th erein. The general distribution of this pamphlet will be of much service both to employes and the public.

A Correction in the Report of the Civil Engineers' Convention.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In a late issue of the *Railroad Gazette* (in the report of the Civil Engineers' Convention) I am represented as saying that "the average velocity was short of the maximum velocity by 2½ per cent." What I did say was, that for rapid transit trains, stopping every quarter of a mile, the maximum velocity is necessarily from 2 to 2½ *times* the average speed including stops, depending on the force per ton of train exerted by the engine and brakes.

I would not have taken the trouble to correct what was an obvious error in the report had not this error involved the most important point in the general question of ordinary *versus* "endless" trains. It requires no argument to prove that a continuous uniform motion of twelve miles an hour is preferable to a suddenly acquired velocity of twenty-four or thirty miles an hour, alternating every minute and a quarter with a full stop, to gain the same average speed.

WM. H. SEARLES.

NEW YORK, June 24, 1875.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

Indianapolis, Peru & Chicago.—The office of General Manager has been created and Mr. V. T. Malott, now Treasurer, has been appointed to that position. Mr. E. C. Murphy, heretofore Superintendent of the Northern Division, has been appointed General Superintendent in place of C. B. Robinson, resigned.

Boston & New York Air Line.—The bondholders of the New Haven, Middletown & Willimantic met in Middletown, June 24, and organized this new company by the election of the following directors: Isaac Anderson, Henry G. Lewis, New Haven, Conn.; John N. Camp, Allyn M. Colegrove, Benjamin Douglas, Middletown, Conn.; J. L. Watson, Bridgeport, Conn.; E. Ellery Anderson, Charles Dana, Henry B. Hammond, New York; D. B. Hatch, Ripley Ropes, Samuel S. Sands, Brooklyn, N. Y.; Thomas C. Clark, Philadelphia. The board elected Samuel S. Sands, President; H. B. Hammond, General Manager; D. B. Hatch, Secretary and Treasurer. The Executive Committee is S. S. Sands, H. B. Hammond, E. E. Anderson, C. Dana, R. Ropes, D. B. Hatch. The general offices will be at Middletown, Conn.

Long Branch & Sea Girt.—The first board of directors of this new company is as follows: Lewis B. Brown, Long Branch, N. J.; Anthony Reckless, Red Bank, N. J.; Henry S. Little, Trenton, N. J.; Gordon D. White, Mattawan, N. J.; Hiram P. Baldwin, Roselle, N. J.; John Kean, Benjamin Williamson, Samuel Knox, James Moore, Elizabeth, N. J.; John Taylor Johnston, James B. Johnston, Robert W. Deforest, John W. Watson, New York. All the directors are connected with the Central, of New Jersey, or the New York & Long Branch.

Lake Shore & Michigan Southern.—Mr. John Newell succeeded Mr. Amasa Stone as General Manager, or Managing Director, July 1. Mr. Newell has been connected with the New York Central as Superintendent, was President of the Cleveland & Toledo for a time, and for some years past and until last Fall, President of the Illinois Central. Since then he has been Vice-President of the Illinois & St. Louis Bridge Company.

Allegheny Valley.—Mr. David McCargo has been appointed General Superintendent of this road, the Oil Creek & Allegheny River Railway, and the Buffalo, Corry & Pittsburgh Railroad, to fill the vacancy occasioned by the resignation of Col. J. J. Lawrence. Mr. McCargo assumed the duties of the position June 23. He has been for sometime past Receiver of the Oil Creek & Allegheny River road.

Poughkeepsie Bridge.—The reorganization of this company has been completed by the retirement of all the directors connected with the Pennsylvania Railroad Company and the election of the following officers: President, John F. Winslow; Vice-President, H. G. Eastman; Treasurer, George Innis; Secretary, George R. Gaylord; Chief Engineer, P. P. Dickinson, New York. The address of the other officers is Poughkeepsie, N. Y.

Atlantic & Pacific.—At the annual meeting in New York, June 25, the following directors were chosen: Cornelius J. Bergen, Thomas T. Buckley, Wm. H. Coffin, James W. Elwell, James D. Fish, Andrew Peirce, Jr., Eugene N. Robinson, Joseph Seligman, George F. Stone, Andrew V. Stout, Henry F. Verhuven, New York; Clinton B. Fisk, Daniel R. Garrison, St. Louis. Messrs. Elwell, Robinson and Stone are new directors, replacing David Salomon (deceased), T. W. Peirce and C. P. Chouteau.

Portland, Dalles & Salt Lake.—Mr. H. Thielsen has been ap pointed Chief Engineer.

Visalia Branch.—Mr. Jesse Hanson, of Tulare, Cal., has been appointed Superintendent.

Northern Central.—The office of Cashier has been created and Mr. W. J. Torrington appointed to the position.

Fayetteville & Goldsboro.—This company has been organized by the election of the following officers: Major D. G. MacRae, President; E. A. Bizzell, Treasurer; J. H. Myrover, Secretary; Thos. J. Robinson, Chief Engineer. The office is at Fayetteville, N. C.

New River.—At the annual meeting in Hinton, W. Va., recently, Harvey Beckwith, Ebert Fowler, Thomas Graham, J. D. Sargeant, P. W. Strother, and G. C. Wharton were chosen directors. The board elected J. D. Sargeant President, and Thomas Graham Vice-President.

Pennsylvania Coal Company.—At the annual meeting in Hawley, Pa., June 15, the following directors were chosen: Geo. L. Brown, John Ewen, William R. Griffith, E. Judson Hawley, Geo. A. Hoyt, John Q. Jones, Charles Morgan, Isaac L. Platt, Jonathan Thorne. The board elected John Ewen, President; Geo. A. Hoyt, Vice-President; Edwin H. Mead, Secretary and Treasurer.

Indianapolis & Western.—At the annual meeting in Indianapolis, Ind., June 24, the following directors were chosen: Wm. A. Henderson, B. C. Hobbs, Nathan Pickett, Parke County, Ind.; J. B. Fordyce, E. Grantham, Jesse Eggers, James M. Nichols, Putnam County, Ind.; George T. Eastes, Abraham Eastes, Hendricks County, Ind.; W. H. Durham, Montgomery County, Ind.; E. J. Peck, John R. Elder, Indianapolis; H. C. Moore, St. Louis. The board elected W. H. Durham, President; George Fleece, Vice-President; Barnabas Hobbs, Secretary; Joseph B. Fordyce, Treasurer; Col. H. C. Moore, Engineer; Joseph E. McDonald, Attorney.

Michigan Central.—At the annual meeting in Detroit, Mich., June 28, the following directors were chosen: James F. Joy, Detroit; John Jacob Astor, Samuel Sloan, George F. Tallman, Moses Taylor, New York; Sidney Bartlett, John W. Brooks, H. H. Hunnewell, Nathaniel Thayer, Boston. The only new director is Mr. Sloan, who succeeds Erastus Corning.

Brunswick & Albany.—Mr. R. S. Meador has been appointed Assistant Superintendent in place of George L. Cook, resigned.

St. Joseph & Denver City.—Mr. Wm. Bond, President of the company, has been appointed Receiver by the United States District Court. He has continued all the present officers in their positions.

St. Louis, Keokuk and Northwestern.—The parties who bought the Mississippi Valley & Western road at foreclosure sale have organized a new company by this name and elected the following directors: Guy Wells, Keokuk, Ia.; L. W. Morse, Hannibal, Mo.; John O. Roberts, Clarksville, Mo.; George Edmunds, Jr., Carthage, Ill.; W. H. Harris, Decatur, Ill.; A. B. Stone, S. C. Baldwin, Cleveland, O. The board elected George Edmunds, Jr., President; A. B. Stone, Vice-President and Treasurer; H. B. Blood, Secretary. It is understood that Mr. Guy Wells will be Superintendent.

New Haven & New London.—The following officers have been elected for the ensuing year: President, Hon. S. B. Chittenden; Vice-President, Samuel Hemingway; Secretary, Treasurer and Transfer Agent, Wilbur F. Day. The road is leased by the New York, New Haven & Hartford Company.

PERSONAL.

—Col. B. Y. Sage, formerly Superintendent and Chief Engineer of the Atlanta & Richmond Air Line, and one of the principal advocates and promoters of the building of that road, died suddenly in Atlanta, June 22.

—General John H. Chedell died in Auburn, N. Y., June 19, aged 69. He was a prominent railroad man in his section, and for several years President of the Southern Central Railroad Company.

—Mr. Amasa Stone, Jr., was to retire from the position of Managing Director of the Lake Shore & Michigan Southern Railway Company, July 1. It has been understood for some time that Mr. Stone wished to retire and that he has only retained the position, which he has filled with so much ability, at the special request of President Vanderbilt.

—Messrs. C. B. Robinson, General Superintendent, and R. M. Hawley, Master of Transportation of the Indianapolis, Peru & Chicago road, have resigned their respective positions.

TRAFFIC AND EARNINGS.

Flour and Grain Movement.

Receipts and shipments for the week ending June 19 were as follows, flour being reported in barrels and grain in bushels:

Flour:	1875.	1874.	Inc. or Dec.	P. c.
Lake ports' receipts	95,756	118,224	Dec.. 22,468	19.0
" " shipments	92,316	105,342	Dec.. 13,026	12.4
Atlantic ports' receipts	216,453	202,523	Inc.. 13,930	6.4
Wheat:				
Lake ports' receipts	1,201,614	1,421,206	Dec.. 219,592	15.5
" " shipments	1,464,582	1,895,077	Dec.. 430,495	22.7
Atlantic ports' receipts	1,578,123	2,506,316	Dec.. 928,193	37.0
Grain of all kinds:				
Lake ports' receipts	2,499,349	4,217,306	Dec..1,717,957	40.7
" " shipments	4,292,917	4,039,948	Inc.. 202,969	5.0
Atlantic ports' receipts	2,939,202	4,594,355	Dec..1,655,153	36.0

Of the total shipments eastward from the lake ports for the week 59.6 per cent. of the flour, and 25.3 per cent. of the grain went by rail.

Coal Movement.

Coal tonnages are reported as follows for the week ending June 19:

	1875.	1874.	Inc. or Dec.	P. c.
Anthracite	324,759	440,451	Dec..115,692	26.3
Semi-bituminous, Broad Top and Clearfield	24,474	.....	.....	....
Cumberland	58,661	.....	.....	....
Bituminous, Barclay	7,281	.....	.....	....
" Western Pa.	30,775	.....	.....	....
" West Va.	5,543	.....	.....	....
Coke, Western Pa.	17,235	.....	.....	....

The strike in the anthracite region is at an end, and nearly all the colleries in the Lehigh and Schuylkill country have gone to work or are making preparation to do so.

The coal tonnage of the Pennsylvania Railroad for the second week in June was:

Anthracite, tons	29,445
Bituminous	70,172
Coke	17,122
Total	107,739

Railroad Earnings.

Earnings have been reported by the following companies:

Year ending March 30:	1874-75.	1873-74.	Inc. or Dec.	P. c.
Cin., Hamilton & Dayton and leased lines	$2,818,116	.....	.....	....
Expenses and taxes	1,885,925	.....	.....	....
Net earnings	$932,191	.....	.....	....
Earnings per mile	8,168	.....	.....	....
Per cent. of expenses	66.92	.....	.....	....
Year ending May 31:	1874-75.	1873-74.		
Chesapeake & Del. Canal	$254,119	$441,906	Dec..$187,787	42.5
Month of May:	1875.	1874.		
Ind., Bloom. & West	$88,047	$119,910	Dec.. $31,863	26.6
Mobile & Ohio	100,532	146,667	Dec.. 46,135	31.5
Second week in June:				
Denver & Rio Grande	9,175	8,678	Inc.. 497	5.8
St. Louis, Iron Mt. & So.	77,900	63,492	Inc.. 14,408	22.7
Two weeks ending June 11:				
Great Western	£30,460	£39,613	Dec.. £9,153	23.1
Two weeks ending June 12:				
Grand Trunk	70,200	84,900	Dec.. 14,900	17.5

Railroad Traffic.

The Central Pacific reports for May a passenger traffic larger than that of any previous month since the completion of the road. For the five months ending May 31 the arrivals of through passengers at and the departures from California points were as follows:

	1875.	1874.	Increase.	P. c.
Arrived	32,568	18,420	14,148	76.8
Departed	10,418	8,460	1,958	23.1
Total	42,986	25,880	16.106	59.9

Live Stock Rates.

The New York *Bulletin* says: "Since the cessation of the railroad war the railroad companies have raised the rates for bringing live stock from the West eastward. The following are the rates from Chicago, which went into operation this week: To New York 55c. per 100 pounds; to Philadelphia and Baltimore, 50c.; to Buffalo, Suspension Bridge, Pittsburgh and Bellaire, 30c.; to Dunkirk, 27½c.; to Cleveland 22c.; to Toledo and Detroit, 18c. The minimum amount of a single shipment for cattle and horses must be 20,000 pounds; for hogs in double deck cars, 22,000 pounds, and for sheep 18,000 pounds; for hogs and sheep in single deck cars, 14,000 pounds.

"The circular presenting the above rates and addressed to live stock dealers in this city and elsewhere, is signed by C. C. Wheeler, General Freight Agent of the Michigan Central Railroad; C. M. Gray, Assistant General Freight Agent of the Lake Shore & Michigan Southern Railway, and William Stewart, General Freight Agent of the Pittsburgh, Fort Wayne & Chicago, and the Pittsburgh, Cincinnati & St. Louis Railways.

RAILROAD LAW.

Liability to an Employe for Injury Caused by Defective Track.

In the case of Porter against the Hannibal & St. Joseph Company on appeal from the Circuit, the Missouri Supreme Court held that the fact that an employe, by the exercise of ordinary diligence, could have known of defects in the machinery provided for his use by the employer, will not bar a recovery for injuries caused by such defective machinery. It is

not the business of the employe, nor has he the means of ascertaining whether the machinery or structure upon which he is employed to operate is defective. It is the duty of the employer to furnish those appliances, and if he fails to do so he is responsible for injuries resulting from defective machinery.

The suit was brought to recover damages for injuries resulting from an accident caused by defective track.

Right of an Express Company to Facilities for Business.

In Sargeant against the Boston & Lowell Company, the Massachusetts Supreme Court has decided that a railroad corporation is not bound to furnish an expressman, who seeks to carry on his business over its road, with facilities and accommodations for so doing, and the fact that it has done so for many years is immaterial. The fact that the company itself desires to carry on such business over its own road is also immaterial.

Enclosure of Railroads.

In a case where a railroad passing through a large field was protected by a cattle guard at each entrance, but had no fences along the line through the field, the Ohio Supreme Court has decided that it was not fenced within the meaning of the law. When cattle running at large had broken into such a field and had been injured by a passing train, the Court held that the owner had not been guilty of contributory negligence.

An Illinois Railroad Bond Suit.

In 1869, the towns of Elmwood and Brimfield, Ill., voted to subscribe respectively $75,000 to the stock of the Dixon, Peoria & Hannibal Railroad Company. The act under which the vote was had authorized towns to subscribe $35,000 only, but the vote on the larger amount was subsequently validated and ratified by an act of the Legislature. The payment of interest was afterwards contested, and the Supreme Court of Illinois decided that the vote having been illegal when it was taken, no subsequent act of the Legislature could make it valid.

The United States Circuit Court, in a suit brought to recover interest, now holds that the bonds are valid and the towns must pay. The Court says: "All of these cases seem to me to be entirely parallel with the case of St. Joseph Township *vs.* Rogers, reported in 16th Wallace, where the Supreme Court of the United States has held in almost diametrical opposition to the opinion of the Supreme Court of this State, that the subsequent acts of the Legislature clothe, or ratify rather, an unauthorized vote and the acts of the town authorities, and makes the bonds valid and renders them a valid claim against the town.

"The reasoning of the Supreme Court of the United States is, that the town being but the creature of the legislative power, and being authorized to do anything which the Legislature authorizes within the limitation of the Constitution, and having done these acts, which might be outside of the scope of its power without the authority of the Legislature, it is in the power of this Legislature to afterwards ratify such acts, and therefore make the proceedings entirely valid and binding upon the town."

Another objection raised, that the bonds were made to run more than 20 years, when the law specified 20 years, is dismissed as being merely technical and not vital to the case. The court regrets that the amount involved is so small as not to admit of an appeal to the Supreme Court.

THE SCRAP HEAP.

The Hall Electric Signals on the Eastern Railroad.

A pretty severe test of the working of the Hall electric signals was had on the Eastern Railroad on the day of the Bunker Hill centennial celebration in Boston. On the special time card for that day there were 43 extra, besides all the regular trains, and in addition a number of irregular extras were sent out and run entirely by telegraph. In all 100 trains were run over the section worked on Mr. Hall's system, and there was no trouble or delay whatever, the signals working very well.

The Columbia Car Spring Company.

This new corporation has bought the works and business of the New York Car Spring Company in New York and will manufacture nest, spiral, rubber-packed and elliptic springs of all kinds for railroad use. Mr. Henry C. Ellis is President, and Mr. J. L. Hornig, formerly of the Union Car Spring Company and well known as a mechanical engineer, is General Superintendent.

Explosion of a Piston.

The steamboat "Novelty" is now undergoing repairs at the works of Hewes & Phillips, Newark, N. J., and a few days since it became necessary to remove the rings from the piston, which was hollow, with two sets of packing rings. The rings were found to be rusted and corroded fast, and the piston was placed on a fire in the blacksmith shop to loosen them by heat. In a few minutes an explosion occurred and the piston was blown to pieces, injuring one man so that he died in a few minutes and hurting another badly about the face. On a close examination of the pieces, it was believed that marks of an old crack were found. It is thought that when hot and under pressure some steam may have leaked through into the piston and subsequently condensed, and the crack may then have been rusted tight. When the piston was heated, this water inside became converted into steam and caused the explosion.

The Watson Manufacturing Company.

Near midnight on the 28th, a fire was discovered in the upper floor of the main building at this company's works, in Paterson, N. J. Prompt measures were taken to put it out, but lack of water and the inefficiency of the local fire department allowed it to spread, and it was not finally subdued until the machine and pattern shops, with the offices of the company, were almost entirely destroyed. The books and papers were saved. The building was less than three years old, having been built after the fire of October, 1872. The foundry and some other buildings were not touched. The loss is estimated at from $120,000 to $150,000, with an insurance of $70,000. The cause of the fire is not known, but a man has been arrested on suspicion of having started it purposely.

The completion of the company's contract for rebuilding the Portage Bridge on the Erie will be delayed a few days only, much of the material having been already shipped. Other heavy contracts will not be seriously delayed. The company is able to keep some 200 men at work in the buildings that were saved, and will make preparations to rebuild at once.

Railroad Manufactures.

The Fulton Foundry, at Cleveland, O., is running full time and turning out 32 car wheels per day.

The works of the Joseph H. Brown Steel & Iron Company are to be built on a tract of 90 acres, given for that purpose, at South Chicago. The property has a dock frontage of 1,500 feet on the Calumet River, with a depth of 14 feet of water. The works are to have a capacity of 150 to 200 tons per day.

The Marquette & Pacific Rolling Mill, at Marquette, Mich., fired up June 10, after stopping about a fortnight.

The Connellsville (Pa.) Machine & Car Company is now filling a large order for Close & Smith's patent steel frogs for the Pittsburgh, Washington & Baltimore road. A full force is employed in the shops.

The Reading (Pa.) *Journal* says: "The Phœnix Iron Company at Phœnixville, are blowing in their blast furnaces at that place, which had been banked up 110 days, owing to a scarcity of coal. This is the greatest number of days that any furnace has ever been banked up in this country, and if Mr. Davis Keely, the furnace man, succeeds in blowing them in again he will have performed a feat that has never before been accomplished. To all appearances the furnaces have not chilled, and he will probably succeed."

The Pittsburgh *Manufacturer* says: "Messrs. Metcalf, Paul & Co.'s works at Verona, on the Allegheny Valley road, are now running full time and turning out some of the finest railroad track tools known in this country. These works were constructed with special reference to the manufacture of railroad track tools of the finest grade of cast steel. They have recently issued a very handsomely illustrated circular, descriptive of their various styles of hammers, picks and their Verona nut lock."

Porter Bell & Co., of Pittsburgh, are building the engines for the Hot Springs Branch Railroad of Arkansas.

The Barney & Smith Manufacturing Company are to furnish the cars for the Hot Springs Branch road.

It is said that the Grant Locomotive Works will be started up with a small force early in July, and that some of the engines on the Russian contract will be completed.

OLD AND NEW ROADS.

Chicago & Southwestern.

In the United States Circuit Court at Keokuk, Ia., recently, arguments were heard in the case of Dows, Winston and others against this company, which is a suit for foreclosure of the first mortgage, brought in the interest of the Chicago, Rock Island & Pacific Company. It appears that the latter company having leased the road, and having guaranteed the payment of interest as it accrued and principal when it should become due, of $5,000,000 of bonds of the Chicago & Southwestern Railway, as a part of its security became subrogated to the rights of the original bondholders, for all sums it should pay in the performance of its contract of guaranty. Among these rights was that vested in the trustees, the complainants, to foreclose the mortgage upon default made by the Southwestern in the payment of interest, subject however in the event of foreclosure upon request of the Rock Island Company to the rights of the bondholders, who would still hold the Rock Island Company upon its guaranty. The Southwestern having made default in the payment of interest from the date of the completion of the road to the present time, the foreclosure is asked.

The petition is opposed by holders of the $1,000,000 bonds, generally known as the Atchison Branch bonds, who claim:

1. That their bonds were sold upon representations, made with the knowledge of the Rock Island Company, that that company would lease the branch road and the main line upon such terms as would secure the payment of interest on the entire bonded indebtedness of the Southwestern.

2. That if there was no such lease, the Rock Island having been the custodian of the proceeds of the $1,000,000 of bonds became a trustee to secure the faithful expenditure, in the interests of the bondholders, of those proceeds in the construction of the road, wherefore if there was fraud in the contracts, as is strongly hinted at, it should be held to have waived its right to a foreclosure or any relief until the bondholders under the second mortgage may assert their rights as the holders not only of the first mortgage upon the branch, but of the second mortgage on the main line.

The Rock Island Company retorts that there is no contract of lease which can be enforced and never was, and that by the terms of the mortgage itself, the disposition of the proceeds of the bonds was provided, from which it could and did not depart.

Chicago, Dubuque & Minnesota.

A meeting of the bondholders of this road and the Chicago, Clinton & Dubuque was held in Boston, June 29. The report of the Committee of Investigation was presented. It was a very long one and advised the passage of the following resolution:

That the Committee be instructed to continue the investigation with the parties against whom claims are supposed to exist, and in case the situation is satisfactory to them the Committee offer to send circulars to all the bondholders for their signatures.

The report concludes as follows: "Having thus finished the duty imposed on them, your Committee leave for your decision the question as to what action shall be taken to test the soundness of Judge Hoar's opinion and to recover the $80,000 of rolling stock."

Northern Pacific.

On behalf of 281 bondholders a petition has been filed with the United States Circuit Court asking that the order of foreclosure and sale may be modified so as to give the bondholders precedence over all other claims, except those for taxes, in the distribution of the proceeds of the sale. The petition claims that the mortgage rightfully is a prior lien on the property to any of the debts due directors and others, which have been contracted since the execution of the trust deed.

Easton & Amboy.

The formal opening of the road took place last week and was a very successful affair. Many prominent railroad officers and operators passed over the road in a special train, were entertained by the company and made an inspection of the new coal docks at Perth Amboy.

Kansas Pacific.

A large party of officers have gone to Colorado to assist in the formal transfer of the Colorado Central road to this company. This excursion gave rise to a rumor of the consolidation of the company with the Union Pacific, which the officers of the latter company deemed important enough to require a formal denial.

Quincy & St. Paul.

A mortgage for $1,800,000 on this projected road has been recorded. It is made to Wm. E. Burr, of St. Louis, and Augustus Kountze, of New York, trustees.

Union Pacific.

A suit has been begun against Mr. John Duff, formerly a director and Vice-President and still a trustee of the land-grant mortgage. It is alleged that Mr. Duff, while trustee, selling lands, etc., received a large amount of money, which he handled as if it were his private property. Shortly after the panic, the company needing ready money, Mr. Duff, it is said, supplied the railroad with the money which he had derived from his operations under his trust, but represented that it was his own, and charged heavy rates of interest. The officers, discovering this fact, demanded the return of this interest, and, failing to receive it, have begun a suit against Mr. Duff for $30,000 and interest, the amount which, it is alleged, was discovered to have been paid to Mr. Duff in this way. Mr. Duff claims that the company owes him a large amount for services as trustee, larger indeed than the amount claimed, and he desires a settlement on that basis. It is also reported that Mr. Duff has made himself obnoxious to the present management in other ways, and hence the real motive of the suit.

Memphis & Little Rock.

A dispatch from Memphis, Tenn., dated June 29, says: "A transfer of the Memphis & Little Rock Railroad to R. K. Dow, yesterday, by President Greenlaw, without the sanction of the board of directors, creates considerable excitement here. Vice-President Brinkley, who owns the controlling interest in the road, after obtaining an injunction from Chancellor Walker, last evening, enjoining Dow from taking possession, attempted to reach Little Rock to oppose Dow in any attempt to have himself appointed receiver, which Brinkley thinks was the real object of the transfer, but was unable to obtain an engine, as President Greenlaw had placed the rolling stock under the orders of Dow. Mr. Brinkley, however, leaves for Little Rock this afternoon, and it is evident that a great amount of litigation will be the result of the action of the President."

Toledo, Wabash & Western.

It is said that the directors have resolved to remove the transfer office from New York to Toledo, and that the change will take place July 31.

Canada Southern.

The car and repair shops at Grosse Isle, Mich., were destroyed by fire on the night of June 26. The loss is estimated at $90,000.

Dividends.

Dividends have been declared by the following companies:

Central of New Jersey, 2½ per cent., quarterly, payable July 20.

Connecticut River, 4 per cent., semi-annual, payable July 1.

Delaware, Lackawanna & Western, 2½ per cent., quarterly, payable July 20.

Housatonic, 2 per cent., quarterly, on the preferred stock, payable July 10.

Pacific of Missouri (Atlantic & Pacific, lessee), 1¾ per cent., quarterly, payable July 20.

New York, Providence & Boston, 2½ per cent., quarterly, payable July 10.

United New Jersey, 2½ per cent., quarterly, payable July 10.

Old Colony, 3½ per cent., semi-annual, payable July 1.

The Boston & Maine and Eastern Agreement.

It is said that the new contract for pooling the earnings of the Boston & Maine and the Eastern roads has been signed and will go into effect July 1. It provides that the net earnings of the two roads shall be divided equally, that is, the road doing the business shall receive 60 per cent. for actual expenses, and half of the remaining 40 per cent. go to the other road. On all business coming from the Maine Central road for competing points on either road, the road doing the business shall retain 60 per cent. for expenses, and the remaining 40 per cent. shall be divided between the two roads in the proportion of 25 to 15, 25 per cent. going to the Eastern and 15 to the Boston & Maine. This will put an end to all controversy regarding through business.

Railway Passenger and Advertising Agents' Convention.

This association met recently in annual convention in Chicago. There was a large number in attendance and a general interchange of views in regard to the objects and accomplishments of the association, and the action had was such as to insure the increased usefulness of the organization. It was decided to hold the next annual meeting at Cleveland, on the fourth Wednesday of June, 1876.

Portland & Rochester.

A through train with drawing room car is now run from Portland, Me., to New London, Conn., connecting at that place with steamboat for New York. It passes over the Portland & Rochester, the Nashua & Rochester, the Worcester & Nashua and the Norwich & Worcester roads.

Central Vermont.

In the case of William Sohier and others against J. Gregory Smith and others, brought in the United States Circuit Court, to test the validity of the stock issued for the purpose of carrying the last election of directors of the Central Vermont, an injunction has been granted restraining the defendants, as prayed for in the bill. This is only a preliminary injunction pending the full hearing of the case.

Montreal, Portland & Boston.

Canadian papers say that the President has succeeded in securing in England the money needed to complete this road, formerly the Montreal, Chambly & Sorel.

European & North American.

At the meeting of creditors in Bangor, Me., June 25, there was a very full attendance. Mr. Noah Woods, Treasurer, presented a report of the financial condition of the company, showing the funded debt to be $4,765,000, and all other indebtedness $1,461,749. The assets are 206 miles of railway in good condition and equipments costing $668,216; real estate in Bangor and St. John, $215,897; a grant of about six million acres of land from the State of Maine, and other assets, $123,000. The Piscataquis branch is not included in this statement. The Superintendent and Road Master reported the road and rolling stock in good condition. Hon. S. H. Blake, Chairman of the Board of Railroad Commissioners, made a highly favorable report of the condition of the line. A committee was appointed to investigate the affairs of the road and report. The exhibit of the company's affairs was much more favorable than was anticipated.

Philadelphia & Reading.

The new yards which this company, it is said, purposes establishing on the Delaware, just above the coal depot at Port Richmond, Philadelphia, will include:

1. A large shipbuilding establishment for the construction of iron steam colliers for the coal trade of the Company.

2. A dry-dock of immense capacity, sufficient to accommodate the largest ocean steamers, so that the repairs of such vessels might be done there where the work can be done more cheaply than in New York.

3. A great storage yard for the iron trade of Philadelphia, available for loans upon warehouse receipts.

4. A port of shipment for the export of heavy freight, such as iron, machinery, etc.

Valley, of Ohio.

The directors have issued a circular to stockholders asking each to take double the amount of his subscription in the 7 per cent. first-mortgage gold bonds of the company, to be issued at 80 cents on the dollar; the subscription for said bonds to be binding after $600,000 are thus subscribed for, and payment to be made therefor as follows: One-fourth in 90 days after said amount is raised, and the balance in three yearly payments thereafter. The circular says that propositions have been received to take these bonds, but the board did not feel warranted in accepting them, as the terms would jeopardise the interests of the stockholders.

Rockford, Rock Island & St. Louis.

The Receiver has given notice that he will pay the taxes of 1873 and 1874, except the disputed items. He was to meet the Greene County collecter in Chicago last week to settle the question in dispute and pay whatever the court might order.

Columbia Conduit Company.

The Oil City (Pa.) *Derrick* says: "It has transpired that in the terms of settlement between the Baltimore & Ohio and Pennsylvania Raslways, it was stipulated that the former should have direct connection with the oil region by the way of the conduit pipe. The management of the Pennsylvania is to allow the line to be laid under the West Pennsylvania track at Power's Run, and it is now announced that oil will be pumped from Butler County to Pittsburgh on or before July 1. During the past two days the company has been receiving oil from Butler County producers, and we have no doubt the work of completing and opening the line will be pushed energetically. At least we infer as much from the character of the new management of the line, which is composed of Messrs. Brough,

Benson, H. McKelvy and others. These gentlemen have, as we understand it, recently received a lease of the line from Dr. Hostetter, with the intention of perfecting it and running it to its full capacity at an early day."

The Proposed Conference of Railroad Commissioners.

The railroad commissioners of six states have responded favorably to the invitation of the Missouri Commission to meet in convention at Springfield, Ill., July 20, for mutual consultation.

Kansas City, Memphis & Mobile.

In order to utilize the grading already done and to secure the completion of the road from Kansas City, Mo., to Osceola, it is proposed to have the four counties of Jackson, Cass, Henry and St. Clair, which have already subscribed largely to the road, guarantee interest and principal of an issue of $1,800,000 first-mortgage bonds. It is thought that these can then be sold for enough to complete the work.

Chicago, Burlington & Quincy.

Forty-eight men were recently laid off from the car department shops at Aurora. The men were not discharged, but suspended temporarily.

Albia, Knoxville & Des Moines.

In the Monroe (Ia.) District Court notice has been filed of an application for an injunction to restrain this company from selling bonds and to prevent the payment of subscription notes to any one but the Quincy & St. Paul Company. The object of the proceedings is to cut off the recent transfer of the road to parties in the interest of the Chicago, Burlington & Quincy. The case will not come up until fall.

Cairo & Vincennes.

As soon as the necessary transfer arrangements at Cairo are completed, through cars are to be run from Pittsburgh and Indianapolis to Texas, passing over this road and the Cairo, Arkansas & Texas Branch of the St. Louis, Iron Mountain & Southern.

Buffalo & Jamestown.

The work on this road is progressing rapidly, and, unless unforeseen delays occur, trains will run through to the Atlantic & Great Western at Jamestown during the present month.

Mexican Railroad Matters.

The contract with Mr. Edward Lee Plumb for the construction of the Mexican International Railroad was finally ratified by the Mexican Congress, May 29, and the President subsequently issued the necessary decree. The vote in favor of its ratification was 116 to 13. We will publish the terms of the contract hereafter.

The new railroad from Vera Cruz to Jalapa is completed, and was to be opened for travel June 15.

The *Two Republics* of Mexico says: "In our last we stated that the concessionists had the right of option in establishing the gauge of the Sonora Railroad. It was a mistake in the translation; the contract binds the constructors to establish the *standard gauge*.

Petersburg.

The contest for the possession and control of this road appears to have broken out again. The City of Petersburg, Va., recently levied on 53 car loads of old rails taken up from the Gaston Branch, the levy being made under judgments recently obtained. The attorneys for the city have filed a bill of interrogatories against Mr. Reuben Ragland, the President of the Company, who is the largest stockholder, but he has thus far been detained in Richmond by sickness. Further legal proceedings are expected.

Alabama & Chattanooga.

In pursuance of the agreement made by the parties in interest and approved by the Court, the order of the United States Circuit Court was made confirming the agreement, which is as follows:

"There being some dissatisfaction as to the reports of the Master in this cause, and the matters thereof being now better understood, the Court may appoint some well-known lawyer and thorough business man to enquire into and with power to settle as Master the various matters of reference involved in the case and ordered by the decrees of the Court. Which settlement shall be final between the parties to this agreement when confirmed by the court.

"Among other matters he shall enquire into and report what moneys have been actually expended in improving the road by the several receivers and by the trustees since they have had possession of the road, and from what sources these moneys were derived, and how derived. and the reasonableness of such expenditure and the particular character of these improvements.

"The parties to this agreement shall take the reports of the master heretofore made, and within thirty days eliminate therefrom all items allowed by him which are not satisfactory, which shall be investigated and passed upon by the new Commissioner, and be reported by him; all other items shall stand confirmed.

"If any of the certificates are objected to by either party, the Commissioner shall inquire and report whether the same were issued in accordance with the orders in the cause, and what disposition was made of the same, and whether the said disposition was in conformity to the said orders, and which in his opinion should be allowed and which rejected.

"What attorneys' fees have been properly paid or incurred for the benefit of the trust, for filing the bill in this case, and for other proper legal expenses for the trust, and to whom the several amounts have been paid or are due.

"What other sums in detail have been properly expended by the several receivers and trustees in the exercise of their duties for the Alabama & Chattanooga Railroad.

"What service said receivers and the trustees have rendered in the proper execution of their trusts, and what, if any, allowance should be made them.

"The Commissioner shall sit openly on notice to the parties by publication. He shall sit as long as the necessities for a full investigation may require; holding one session in or convenient to New York and the other at Chattanooga, Tenn. The contested claims, as presented, shall be entered and each party shall have full and fair opportunity to examine into and support and contest the same before said Commissioner.

"All parties in interest shall have from the Commissioner subpœnas for witnesses or the right to take, on interrogatories and notice, depositions of witnesses who may reside out of the Judicial District where the sittings are, affidavit being made before the Commissioner of such non-residence.

"All books and accounts of the several receivers and trustees, and of the railroad shall be open to inspection and examination at Chattanooga by the Commissioner and the parties interested.

"If the Commissioner appointed under this agreement can make his report before the next term of this Court, the parties agree that the matters involved may be then heard and decided in vacation, on notice, by Judge Bradley and Judge Woods, or either of them, and the decision entered as if made in open court in term time; and it shall be in all respects the same as any judgment or decree of the Circuit Court of the United States for the Southern District of Alabama.

"The bondholders of the first mortgage have the rights and standings in the case of actual formal parties, and are to be treated as such, as represented by the undersigned, their attorney.

'It is agreed that John C. Stanton shall be appointed Receiver of the road, and hold and operate the same, together with any and all other property belonging to said road, until the further order of this Court, on giving a good and sufficient bond in the penalty of $25,000 for the discharge of his duties. He shall file in this Court monthly statements of the earnings, expenses, receipts and disbursements of the road.

"He may raise money to pay taxes, insurance, and to make necessary improvements on the road, so far as to keep it in working order necessary for business, but only on submitting to Robert H. Smith, attorney for bondholders, and William F. Drake, as the representative of the holders of the Receiver's certificates, the several transactions on which the money is proposed to be raised, and the purposes for which it is needed, and on their written and consent thereto. Said sums so raised and applied to the uses named shall be a charge on, and paid from the proceeds of the sale of the road in accordance with the decrees of this cause."

As already noted, Mr. Philip Phillips, of Washington, is the Special Master appointed by the Court.

Utica, Ithaca & Elmira.

The Ithaca (N. Y.) *Journal*, speaking of the work now in progress on this road, says: "Starting from where a steam shovel is eating its way into the gravel bank near where the connection with the Cortland Division is to be made just above where the Dryden road crosses the track, a mile east of Ithaca, following the old Murdock Line to near Mott's Corners, it is very evident that very little additional work is needed to prepare the roadbed for the iron. A few trestles will only have to be replaced, and the embankment restored in some places where it is slightly washed.

"At Mott's Corners a large force of men and teams is busily at work, leveling the last few rods of the deep cutting just west of Six Mile Creek, and between Mott's Corners and the track. In this bank there is an immense amount of the finest gravel deposits that will prove very valuable for fillings, gradings and repairs. The approaches to the Mott's Corners trestle over Six Mile Creek, which is to be 800 feet long and 75 high, are virtually completed, and the long rows of solid foundation piles await the Phœnixville iron tubes, which will probably be used for upper work, as they do so well in the grand structure at Van Ettenville. * * *

"Near Wilseyville, where the line again turns westward toward Elmira, it skirts the edge of the frowning, wooded hills. The excellence of the grading here is noteworthy, several miles being laid on a natual bed of the hardest and finest gravel, where there is no chance for a 'wash out.' About three miles from Wilseyville, is another steam-shovel, digging gravel from an inexhaustible bank. All the distance from Wilseyville to Spencer, iron is laid. Mounting a construction engine, the reporter rode westward past gangs of men busy at ballasting, great piles of ties and bridge timber, busy saw mills, Spencer Springs, and over the lovely natural meadows that lie between the crested hills and that compare with their turf carpet, and groves of maple and elm, with the famous Connecticut meadows near Springfield and Hartford. Arriving at Spencer the road continues on three miles of leased track on the Geneva, Ithaca & Athens, which will of course soon be supplemented by an independent line, for which the surveys have been made, and negotiations opened for right of way. Beyond, from Van Etten to Elmira, is the firmly built, permanent regular line. Now that the Erie railroad again has a responsible management, a third rail will soon be laid on its broad gauge, thus extending the road to Corning, and direct, short connections with the richest Pennsylvania coal mines. But for the uncertainty in Erie matters this would have been done before now."

Chippewa Falls & Western.

The completion and formal opening of this road from Eau Claire, Wis., on the West Wisconsin, to Chippewa Falls, 12 miles, was to be duly celebrated June 29. The road has been completed for several months.

Milwaukee & Northern.

A circular to the bondholders of this company, issued by the trustees, recites the circumstances of the lease to the Wisconsin Central, and the failure of that company to advance money as agreed upon, and says: "In accordance with such request (to have a receiver appointed) we have commenced proceedings in the United States District Court at Milwaukee, and expect such receiver to be appointed very soon."

The circular also approves a proposition made by the stockholders that the overdue coupons of December 1, 1874, and December 1, 1875, shall be paid in preferred stock, the coupon of June 1875, in cash. The stockholders will agree to unite with the bondholders in the selection of some reliable person who shall be appointed by the Court to act as receiver, and take charge of the management of the road, and that all the net earnings under the most judicious and economical management shall be applied as follows:

The payment of coupons due June 1, 1876.

Any surplus earned before that time shall be applied to purchasing additional rolling stock, completing the fencing, some additional depot grounds, buildings and side tracks.

Bondholders accepting are requested to notify the trustees and to send the three coupons named to Mr. A. Apgar, care of the Merchants' Exchange National Bank, New York.

Washington City, Virginia Midland & Great Southern.

Surveys are being made for a new line between Gordonsville and Charlottesville, Va., where the track of the Chesapeake & Ohio is now used. A line has been run from Orange Court House and another from Rapidan Station. The question of building this line has been under discussion for several years past.

Put-in Bay, Ottawa & Danbury.

This company has been organized in Ohio to build a railroad from the Lake Shore at Danbury, O., to Ottawa City, with a branch to Marblehead. The capital stock is to be $50,000.

New Jersey Midland.

A plan of reorganization has been proposed, the leading features of which are the organization of a new company, the issue of $4,500,000 new first-mortgage bonds, $800,000 to complete the road to the Hudson River and pay off floating debt, and $3,700,000 to exchange for outstanding bonds and coupons; the issue of first preferred stock for the present second-mortgage bonds and coupons, of second preferred stock for the consolidated bonds and coupons, and of common stock for the present stock.

A number of first-mortgage bondholders seeing the obvious defects of this plan, in that it does not protect their rights and would really give the control and management of the property to the subordinate interests, and that it would load the road down with an extravagant capital account, have called a meeting of first-mortgage bondholders, to be held at No. 152 Broadway, New York, July 14, at 12 noon, to consider what had best be done.

Corning & Sodus Bay.

The United States District Court recently decided in favor of the validity of $129,000 bonds voted by the town of Lyons, N. Y., in aid of this projected road. The case will probably be appealed.

Boston & New York Air Line.

The first-mortgage bondholders of the New Haven, Middletown & Willimantic road met in Middletown, Conn., June 24, and organized this new company under the charter lately granted by the Connecticut Legislature. Out of the $3,000,000 bonds $1,681,000 were represented and voted on. It was voted that the bonds of the new mortgage for $500,000, which are to be issued to provide means for putting the road in good order and equipping it, should not be sold at less than 95. It was also voted that the new bonds should be offered first to the new stockholders (who are the old bondholders) *pro rata*. The office of the new company is to be at Middletown, Conn.

Massillon & Coshocton.

The project for a railroad from Massillon, O., south by west to Coshocton, after laying dormant for two or three years, has been revived, and parties are holding meetings and trying to get subscriptions along the line.

Indianapolis & Western.

At the annual meeting, June 24, resolutions were passed authorizing the Executive Committee to arrange for a consolidation with any other railroad company which would aid in building the road.

The Illinois Railroad Law.

In the test suit brought against the Toledo, Wabash & Western, to recover penalties for infraction of the railroad law, the case was given to the jury after long and elaborate arguments on both sides. The jury could not agree and were discharged.

Tyler Tap.

Nearly one-half of this road is graded, and the contractors are pushing the work forward. The road is to run from Tyler, Tex., northward to the Texas & Pacific at Big Sandy, 20 miles. It is to be a narrow-gauge road.

Texas Western.

The track is laid from Houston, Tex., west six miles, and the work is advancing steadily.

Lafayette, Muncie & Bloomington.

The directors of this company intend to resist the attempt made by the new Frankfort, Muncie & Bloomington Company to take possession of the partially graded road-bed between Lafayette, Ind., and Muncie. A contract has been recently concluded with Mr. D. P. Eels, of Cleveland, O., by which he agrees to complete that section of the road in one year, equip it and build repair shops at Lafayette, the company to secure the right of way and complete the grading and bridging. Mr. Eels is to receive $1,600,000 in first-mortgage bonds of the company and a like amount in stock. The distance is a little over 80 miles.

Western North Carolina.

The judicial sale of this road finally took place at Salisbury, N. C., June 22. The purchaser was Hon. A. S. Merrimon, who subsequently transferred his purchase to the Commissioners appointed under the recent act of the North Carolina Legislature, who are to complete the road through to Asheville. The price paid was $825,000.

The road is 114 miles long, from Salisbury, N. C., west to Old Fort. It has been bankrupt and in litigation a long time and the case has been carried up to the United States Supreme Court. It is intended to run through to a connection with the railroad system of Tennessee.

Toledo, Wabash & Western.

A meeting of the holders of the equipment bonds of 1863 was held in New York, June 28. There are $600,000 of these bonds outstanding, and at the time the general consolidated mortgage was executed provision was made for exchanging them for this new issue. Steps have been taken to foreclose the consolidated mortgage, and the holders of the bonds issued under it now refuse, it is stated, to admit the equipment bonds to any share of their claim. At the meeting a committee, consisting of J. W. Sullivan, B. F. Hain and Charles Jackson, was appointed to take measures to protect the interest of holders. The latter agreed to pay an assessment of $1 on each $1,000 bond to meet necessary expenses.

Pueblo & Arkansas Valley.

Tracklaying has been begun on this road, the extension westward of the Atchison, Topeka & Santa Fe. At the latest dates received, the tracklayers had reached a point 6½ miles west from Granada, Col., the starting place.

Wheeling & Lake Erie.

At a recent meeting of the board the contractors were authorized to increase the working force and to push the work at the points where the grading is heavy.

Springfield, Decatur & Indianapolis.

It is said that this company, organized by the bondholders who bought the Indiana & Illinois Central road, is about to put a new mortgage of $1,100,000 on the road, the proceeds to be used to complete the road from Montezuma east to Indianapolis.

Fayetteville & Goldsboro.

The stockholders met in Fayetteville, N. C., June 19, completed the organization of the company, and voted to accept the charter as passed by the North Carolina Legislature. Arrangements were made for a survey of the route, which is from Fayetteville east by north to Goldsboro, about 55 miles.

Manchester & Keene.

The line of this proposed road has been examined by several contractors, who are to make a proposition for its construction.

Paw Paw.

This road has been purchased from Mr. H. S. Ismon, of Jackson, Mich., for $30,000 by a number of residents of Paw Paw and Lawton. It will be put in good order and possibly extended to Schoolcraft. The road is about five miles long, from Lawton, Mich., northwest to Paw Paw.

St. Louis, Keokuk & Northwestern.

This is the name of the new company organized by the parties who bought the Mississippi Valley & Western road at the recent sale. The sale has been approved, the cash payments required have been made, and the deed for the property given by the Court. A party of engineers is to be put on the extension to St. Louis at once, and the grading is to be completed.

St. Joseph & Denver City.

The United States District Court for Kansas has finally entered the decree of foreclosure under the first mortgage, and has appointed Mr. Wm. Bond, President of the company, Receiver of its assets. The date of sale has not yet been fixed.

New York, Boston & Montreal.

In the United States Circuit Court for New York, June 23, a bill in equity was filed against this company by Messrs. Evarts, Southmayd & Choate, as attorneys for the Banque Franco-Egyptienne, Hentsh, Lutscher & Co., and a large number of other foreign holders of bonds. The bill alleges that an issue of $6,250,000 first-mortgage bonds was brought out by Bischoffsheim & Goldschmidt in London, being part of a total issue of $12,250,000. A circular was issued stating that the Company was formed by the consolidation of several others; that the line was to be 350 miles long, of which 200 miles was already in successful operation; that the remaining $6,000,000 first-mortgage bonds with $6,575,000 second-mortgage bonds would be held by the trustees to extinguish the divisional mortgages and other debt; that advantageous contracts had been made with the Erie and other companies; and that the road would have a gross income of over $5,000,000 per year. It is alleged that these representations were false; that the Dutchess & Columbia and Harlem Extension companies, which

formed part of the consolidation, were insolvent and that this fact was carefully concealed. It is further alleged that from the proceeds of bonds sold $3,405,682.52 were delivered to the trustees, John C. Brown, Wm. Watts Sherman and Jesse Seligman, to be by them applied to the completion of the road and that the money was not so applied. The bill closes with a number of questions as to the affairs of the company.

Poughkeepsie Bridge.

The directors connected with the Pennsylvania Railroad Company having all retired and the Pennsylvania subscriptions having been withdrawn, the company has been reorganized, the new officers being all Poughkeepsie men. Active measures are to be taken to raise the capital required. It is expected that $300,000 can be raised in Poughkeepsie, a like sum in Hartford and the balance in Boston.

New York, Kingston & Syracuse.

At a meeting of the bondholders, stockholders and unsecured creditors of this company held in New York, June 24, a majority of the stockholders was present, and a large amount of both classes of bonds and of creditors was represented. Clark Bell, Wm. H. Wait and Thompson Deane were appointed a committee to confer with the stockholders upon the subject of a redemption of the road from the Farmers' Loan and Trust Company, under the law of 1853. The committee were also instructed to see if the unsecured creditors or the holders of the second-mortgage bonds could obtain recognition under the proposed plan of reorganization.

Atlantic & Great Western.

The English holders of the first-mortgage bonds are said to be very generally opposed to the McHenry plan of reorganization, for the reason that under it they would lose their first lien upon the road, and become partners instead of creditors. Among holders of other securities there appears to be much difference of opinion. The suggestion has been made that the claims of the holders of the different classes of securities be submitted to arbitration, disinterested persons who command general confidence to be selected for that purpose, and commissioned to prepare a plan of reorganization.

Notice is given in London that by the order of Vice-Chancellor Hall in the cases of Lee and Morrison against Swinburne, Mr. Henry Wollaston has been appointed Receiver of all moneys received and to be received on account of the leased line rental trust bonds of 1872, and that the necessary steps are being taken for a division of the funds already received, among the owners of those bonds.

Portland, Dalles & Salt Lake.

It is said that English capitalists have agreed to take hold of this projected road, provided existing contracts are so modified that the surveys and estimates will be made by the company instead of the contractors.

Nevada County.

The iron for this narrow-gauge road has been contracted for in St. Louis, and the engines have been ordered from the Baldwin Locomotive Works in Philadelphia.

Sonoma & Marin.

Bids have been received for the grading of this road from Petaluma, Cal., to the Marin County line at San Antonio Creek. The work is to be completed in September.

A Southern Railroad Meeting.

A meeting was held in New York, June 24, at which were present representatives of the Atlantic, Mississippi & Ohio, the Richmond & Danville, the Seaboard & Roanoke, the Wilmington, Columbia & Augusta, the Charlotte, Columbia & Augusta, the South Carolina, the Central of Georgia, and the various steamship companies whose lines run from New York to Norfolk, Charleston and Savannah. The meeting was private, but it is understood that, after a long discussion, it was finally resolved to maintain the freight rates of 1873 from New York to competing points south. No action was taken on passenger fares.

New York & New England.

The order of the Massachusetts Supreme Court putting this company in possession of the Boston, Hartford & Erie road, requires it to assume the existing floating debt, about $325,000. The trustees, who have been operating the road, were allowed compensation at the rate of $10,000 per year.

New York & Long Branch.

This new road was formally opened June 25, when an excursion train with over 800 invited guests, including the President of the United States and other noted persons, passed over the road in an excursion train. The party on arriving at Long Branch were entertained by a handsome lunch given by the company.

Southern Pacific.

On the extension of the Los Angeles Division southeast towards the San Gorgonio Pass, the track is laid to a point 12 miles beyond the old terminus at Spadra, Cal., and 40 miles from Los Angeles. The work is being pushed forward and a large force is employed.

ANNUAL REPORTS.

Seaboard & Roanoke.

This company owns a line from Portsmouth, Va., west by south to Weldon, N. C., 80 miles.

During the past year the road has been kept in good order, and 600 tons new iron rails have been laid, beside 100 tons of steel in the Portsmouth yard. New abutments have been built to the Goose Creek Bridge, several culverts have been built, and a new water station on the Blackwater River at Franklin. The remaining two-thirds interest in the water front property at Portsmouth, of which the company owned only one-third, was bought for $16,000.

Twelve new freight cars were added to the equipment, three box and ten flat cars rebuilt. The Blackwater steamers have been kept in good repair.

The capital account is extremely light and is as follows:

Capital stock ($17,070 per mile)	$1,365,600
Funded debt ($2,630 per mile)	210,400
Total ($19,700 per mile)	$1,576,000

The entire funded debt is less than the net income of an average year.

The earnings and expenses for the year ending February 28 were as follows:

	1874-75.	1873-74.	Inc. or Dec.	P. c.
Passengers	$94,642 26	$95,496 96	Dec.. $854 70	0.9
Freight	416,660 41	499,305 07	Dec.. 82,644 66	16.55
Mails	6,000 00	6,000 00	.....	.....
Other sources	46,123 14	49,820 14	Dec.. 3,697 00	7.4
Total earnings	$563,425 81	$650,622 17	Dec..$87,196 36	13.4
Operating expenses	382,273 01	411,673 68	Dec.. 29,400 67	7.1
Net earnings	$181,152 80	$238,948 49	Dec..$57,795 69	24.2
Interest, etc	24,092 47	15,388 97	.....	.....
Balance	$157,060 33	$223,559 52	Dec..$66,499 19	29.7
Gross earn. p. mile	7,042 82	8,132 78	Dec.. 1,089 96	13.4
Net earn. per mile	2,264 41	2,986 86	Dec.. 722 45	24.2
Per ct. of expenses	67.85	63.27	Inc .. 4.58	7.2

The President's report says: "While there has been a decrease in tonnage, the falling off in revenue is more attributable to the lower rates received for transportation by this company, and to the marked decrease in the amount of cotton carried over the road destined for New York and Boston.

"Chiefly in consequence of the charges for transporting cotton by steamers from points south of Hatteras to New York and Boston, being no greater and in many cases very much less than from Norfolk, during the past winter it appears that the amount of cotton carried for New York has fallen off 35,782 bales, while the amount for Boston has fallen off 16,218 bales; nevertheless, it is gratifying to notice that the amount carried under consignment to merchants of Norfolk and Portsmouth has been increased 19,561 bales.

"In view of the small amount of cotton consigned to the port of Norfolk only a few years ago, your Board congratulate your company on the successful enterprise of the merchants of Norfolk and Portsmouth, by whose efforts, united to those of the company, the consignments to the amount of 60,614 bales of cotton have been produced during the past year, notwithstanding the disadvantages before alluded to under which they have labored."

Chicago, Rock Island & Pacific.

During the fiscal year ending March 31, 1875, this company operated precisely the same lines as during the previous year, which were as follows:

	Miles.
Main line, Chicago, Ill., to Council Bluffs, Ia.	500.71
Branch, Wilton, Ia., to Sigourney	78.76
Branch from Des Moines, Ia., to Indianola, with branch to Winterset	48.24
Total owned	627.71
Peoria & Bureau Valley road, Bureau Junction, Ill., to Peoria	46.75
Total worked, covered by report	674.46

Of which 500.71 miles are main line and 173.75 branches. The company also works under lease the Chicago & Southwestern road, from Washington, Ia., to Leavenworth, Kan., 270 miles, with a branch from Atchison Junction, Mo., to Atchison, Kan., 30 miles, but the earnings and expenses of this line are not included in the report.

During the year 50.8 miles of track were relaid with steel and 38 miles with rerolled iron rails, and 40,106 rails were cut and repaired in the shops. The material used was 4,789 tons steel 3,577 tons rerolled iron rails, 237,900 pounds spikes, 470,836 pounds fish-bars and bolts, and 251,444 new ties. Of new sidings 8.62 miles were laid. There are now 184.8 miles of track laid with steel. The work of reducing the grade near Ainsworth and west of Davenport has been carried on; 48 wooden culverts have been replaced with stone; the new engine-house and shops at Rock Island completed; a brick shop 150 by 100 feet, with wing 32 by 29 feet, built to replace the old wooden shops; new passenger depots of brick built at Joliet, Ottawa and La Salle, and a new freight house of brick built to serve both La Salle and Peru. Many minor improvements have been made.

The equipment with which the whole system, including the Chicago & Southwestern road, was worked, was as follows at the close of the last two fiscal years:

	1875.	1874.	Increase.
Locomotives	217	215	2
Sleeping coaches	12	11	1
Day coaches	69	67	2
Baggage, mail and express cars	24	23	1
Postal cars	6	5	1
Passenger train cars	111	106	5
Box cars	2,408	2,408	..
Stock cars	622	622	..
Platform and coal cars	979	979	..
Caboose and drovers' cars	85	77	8
Freight train cars	4,094	4,086	8
Paymaster's car	1	1	..
Pile-driving car	1	1	..
Wrecking car	1	1	..
Gravel dump cars	40	40	..
Service cars	43	43	..

Besides the usual repairs to the equipment, there have been built to make good loss and depreciation 26 platform, 35 stock and 74 box cars, which made no increase of equipment; these, as well as one sleeping coach, two day coaches, one baggage car and three caboose and drovers' cars added, were charged to repairs. All the passenger train cars are equipped with air brakes. It is expected that about 200 new freight cars will be needed the current year.

The property is represented by the following securities, in which there has been no change during the year:

Stock ($39,829 per mile owned)	$25,000,000
Funded debt ($14,338 per mile owned)	9,000,000
Total ($54,167 per mile owned)	$34,000,000

The profit balance of income account is $6,542,970.66, nearly all of which is offset by $4,020,000 of its own stock held by the company, and $2,358,562.37 advances made on account of the Chicago & Southwestern. The expenditure on construction and equipment account during the year were $514,447.40, the leading items being $124,514 excess in cost of 4,789 tons steel rails over the same quantity of iron, and $100,295.39 for new engine-houses and shops.

The commissioners of the sinking fund report $181,297.74 received during the year, and a balance of $502,216.49, in securities and cash, on hand at its close.

The company has a land grant in Iowa, and the Land Commissioner reports sales of 35,787.49 acres for $287,031.72, an increase of 45 per cent. Excluding 1,105.8 acres of swamp lands to which the title is doubtful, and which were quit-claimed for $1,066, the average price was $8.25 per acre. The unsold lands amount to 431,489 acres, more than three-quarters of which are in Audubon, Shelby and Pottawattomie counties, and the Commissioner renews the suggestion made last year, that it might be worth while to build a branch to make these lands more accessible and consequently more saleable.

The earnings and expenses for the year were as follows:

	1874-75.	1873-74.	Inc. or Dec.
From passengers	$1,677,460 76	$1,669,570 62	Inc.. $7,890 14
Freight	5,292,412 24	5,003,001 07	Inc.. 289,411 17
Mails	149,946 52	149,044 61	Inc.. 901 91
Express	93,950 00	107,098 22	Dec.. 13,148 22
Rents, interest, etc.	160,493 74	104,724 72	Inc.. 55,769 02
Car service	7,849 45	8,748 32	Dec.. 898 87
Telegraph	6,522 05	6,015 74	Inc.. 506 31
Total earnings	$7,388,634 76	$7,048,203 30	Inc..$340,431 46
Operat'g expenses	3,534,958 42	3,698,666 85	Dec.. 163,708 43
Legal expenses	36,750 21	40,646 24	Dec.. 3,896 03
Taxes	284,620 98	137,576 17	Inc.. 147,044 81
Total expenses	$3,856,329 61	$3,876,889 26	Dec.. $20,559 65
Net earnings	$3,532,305 15	$3,171,314 04	Inc..$360,991 11
Gross earnings per mile	10,954 24	10,449 52	Inc. 504.72
Net earnings per mile	5,236 92	4,701 73	Inc. 535.19
Per cent. operating expenses	47.84	52.47	Dec..... 4.63
Per cent. of expenses, including legal expenses and taxes	52.19	55.00	Dec..... 2.81

The increase in gross earnings was 4.8 per cent.; the decrease in working expenses 4.4 per cent.; in expenses, including taxes, 0.5 per cent.; the increase in net earnings 11.4 per cent. The gain in the actual cost of working the road was nearly offset by the very great increase in the taxes paid.

The payments from net income were:

	1874-75.	1873-74.	Increase.
Dividends	$1,678,384	$1,659,172	$19,212
Interest on bonds	630,000	629,125	875
Rent Peoria & Bureau Valley road	125,000	125,000	.....
Total	$2,433,384	$2,413,297	$20,087
Surplus for the year	1,008,921	843,387	255,534
Surplus at close of year	$6,542,971	$5,433,071	$1,109,900

The work done during the year was as follows:

	1874-75.	1873-74.
Passenger train mileage	1,020,010	1,035,813
Freight train mileage	3,540,287	3,315,334
Service train mileage	303,563	334,859
Total train mileage	4,863,860	4,686,006
Passengers carried one mile	54,804,212	49,186,817
Tons freight moved one mile	287,913,578	249,523,401

There was an increase of 3.8 per cent. in train mileage, with an increase of 11.4 per cent. in passenger mileage and 15.4 per cent. in tonnage mileage. The average receipt per passenger train mile was $1.64½, against $1.61 the previous year. The average receipt per freight train mile was $1.49½ and the expense $0.78¼, against $1.51 and $0.83. The average cost of engine service was 19.10 cents per mile, against 20.01 cents.

For the last six fiscal years the average receipts per passenger and per ton of freight per mile have been as follows:

	Passenger.	Freight.
1869-70	4.590 cents	2.74 cents
1870-71	3.840 "	2.64 "
1871-72	3.617 "	2.49 "
1872-73	3.596 "	2.29 "
1873-74	3.394 "	2.07 "
1874-75	3.061 "	1.92 "

The decrease during the six years has been in the passenger rate 33.3 per cent., and in the freight rate 29.9 per cent.

Maine Central.

During the fiscal year ending December 31, 1874, this company operated the following lines:

	Miles.
Portland, Me., to Bangor	185¼
Cumberland Junction to Augusta and Skowhegan, and Bath Branch	101¼
Brunswick to Leeds Junction and Lewiston	33
Leeds Junction to Farmington	37¾
Belfast to Burnham	33¼
Newport to Dexter	14
Total	355

The two last named lines are leased; the others are either actually or practically consolidated with the Maine Central.

The property was represented at the close of the year as follows:

Maine Central stock	$3,020,120
Portland & Kennebec stock	741,400
Yarmouth stock	10,200
Total stock ($14,295 per mile)	$4,371,720
Bonded debt	6,054,265
Interest Scrip	496,892
Total funded debt ($21,287 per mile)	6,551,157
Floating debt, notes payable ($4,130 per mile)	1,377,060
Total ($39,622 per mile)	$12,199,967

During the year, $749,217.53 of the old bonded debt has been retired. This expenditure has been met by the issue of notes payable, and the sale of $382,500 new consolidated bonds. The construction account has been increased $3,278,847.10, and the equipment account $550,000, by the transfer to them of the balances of the following accounts, which have been closed: Waterville Bridge, Maine Central Extension, Real Estate, Improvement, Bangor Pier Company, Portland & Kennebec lease, Leeds & Farmington lease.

The earnings and expenses for the year were as follows:

	1874.	1873.	Inc. or Dec.	P. c.
Passengers	$910,391 89	$916,405 22	Dec... $6,013 33	0.7
Freight	1,028,965 41	1,010,615 11	Inc... 18,350 30	1.8
Mails	53,427 76	33,911 58	Inc... 19,516 18	57.5
Express	37,712 00	37,288 00	Inc... 424 00	1.1
Car use	56,625 69	65,303 65	Dec... 8,677 96	13.3
Miscellaneous	6,957 80	4,554 22	Inc... 2,403 58	52.8
Total earnings	$2,094,080 55	$2,068,077 78	Inc...$26,002 77	1.3
Fuel	205,633 63	176,287 53	Inc... 29,346 10	16.6
Maintenance of way	461,334 71	467,296 37	Dec... 5,961 66	1.3
Train expenses	351,038 44	412,651 86	Dec... 61,613 42	14.9
Station "	186,897 93	191,002 62	Dec... 4,104 69	2.1
Office "	46,543 90	35,392 51	Inc... 11,151 39	31.5
Not classified	.....	12,485 28	Dec... 12,485 28	....
General expenses and taxes	30,232 64	35,408 27	Dec... 5,175 63	14.6
Total expenses	$1,281,681 25	$1,330,501 44	Dec...$48,820 19	3.7
Net earnings	$812,399 30	$737,576 34	Inc...$74,822 96	10.1

The receipts of the road have been materially affected by the general stagnation of business. The road has been kept in good condition, the decrease in expenses having been effected by close economy and strict attention to details.

The work of the year was as follows:

Passenger train mileage	504,216
Freight " "	439,632
Service " "	287,178
Total " "	1,231,026
Passengers carried	762,734
Passenger mileage	27,666,119
Tons freight hauled	422,400
Tonnage mileage	25,313,400

The decrease in train mileage was 2.2 per cent. from 1873.

The averages per mile of road worked were as follows:

Gross earnings	$5,898 82
Expenses	3,610 37
Net earnings	$2,288 45
Train mileage	3,524
Passenger mileage	77,933
Tonnage mileage	71,305

The operating expenses were 61.20 per cent. of receipts in 1874, against 64.34 per cent. in 1873. The average receipts per ton per mile were 4.07 cents; cost, 2.49 cents; net receipts, 1.58 cents. The average receipts per passenger per mile were 3.3 cents.

A summary of the income account is as follows:

Balance from 1873		$330,737 50
Net earnings of 1874		812,399 30
Sales of consolidated bonds		382,500 00
Notes payable		395,449 53
Sales of real estate, outstanding coupons, etc		33,813 84
Total receipts		$1,954,900 17
Interest and dividends on guaranteed stocks	$569,138 47	
Rent, Dexter & Newport R. R.	18,000 00	
Rent, Belfast & Moosehead Lake R. R.	36,000 00	
Discount on bonds sold	22,881 50	
Improvement account	103,016 06	
Equipment account	48,266 60	
Bonded debt paid off	749,217 53	
		1,556,520 16
Balance to 1875		$398,380 01

During the year the company has completed the iron bridge

over the Kennebec River between Waterville and Fairfield, and replaced the old wooden bridge over Ticonic Falls with a first-class iron bridge, which was opened for use in the Summer. There are now four first-class iron bridges on the line from Portland to Bangor, via Augusta—three over the Kennebec and one over the Androscoggin at Topsham.

The report gives an account of the new contract with the Boston & Maine, which has already been noted. A large part of the President's report is occupied by an argument as to the right of the company to exemption from taxation under its charter, which question is now in controversy with the State.

English Experiments with Continuous Brakes.

Arrangements were made by the Railway Companies' Association of England a short time ago to make a series of trials of continuous train brakes. These trials were to be made under the auspices of that Association for the purpose, as stated by *Engineering*, of eliciting information for the "public generally and railway companies in particular, and of affording information to the Royal Commission now inquiring into railway accidents and the means of their prevention."

The time and place for the trials are stated by *Engineering* as follows:

The experiments are to be made on the 9th and 10th of June (while, if necessary, the two following days are also to be devoted to them), and they are to be carried out under direction of Mr. Edward Woods, acting for the Railway Accidents Commission, and Colonel Inglis, R. E., representing the Board of Trade. The trials are to be carried out on the Nottingham & Lincoln Branch of the Midland Railway, between Newark and Thurgaton, and a length of this line has been staked out with distance posts, and the levels carefully taken. The experiments will be carried out at speeds varying from 20 to 60 miles per hour, and, of course, every provision will be made for accurately determining the speeds and the distances run, and time occupied in making stops.

The following is the programme of the experiments referred to:

Each train to consist of 13 passenger carriages and two brake-vans.

The carriages may be four-wheel or six-wheel, at the company's option.

The engines and trains complete should be brought to the Derby station of the Midland Railway not later than Friday morning, June 4, so as to allow time for weighing the engines and carriages in detail.

Each carriage to be loaded with a weight corresponding with the number of seats, reckoning, say, ¾ cwt. per seat, to represent an average load of passengers with luggage. Each van to be loaded with a weight of tons as representing the average weight of luggage it conveys.

The weight of each carriage and van empty to be carefully taken.

The weight of each loaded carriage to be taken in the like manner.

The weight of each engine used in the experiments—noting height of water in gauge-glass at the time and approximate quantity (weight) of fuel in fire-box.

The weight of each tender used in like manner to be noted:

1. Without coke and water.
2. With water only, tank full and height noted.
3. Weight of coal or coke in tender at starting.

A general description to be furnished of the particulars of application of the brakes of each description to the respective trains.

The ground selected for the trials is the line of the Nottingham & Lincoln Branch of the Midland Railway between Newark and Thurgaton. This ground to be staked out as may be directed, the levels carefully taken, and section plotted.

The particulars will be furnished to the companies who have provided the trains for experiment.

The days selected for the trials are the 9th and 10th, and, if necessary, the 11th and 12th of June next.

All the trains should be brought to Newark in readiness for proceeding with the trials early in the morning, June 9.

The direction in which the trains will be worked in making the experiments will be from Newark or Rolleston Junction towards Nottingham, and the carriages and engines must be coupled up accordingly.

Each train to be provided with a slip-coupling, to be used as may be required.

It is desired that all comparative experiments, class by class, should be made as nearly as the case will permit at the same time, and under the like circumstances of weather, wind, state of rails, etc.

Should the weather be favorable June 9, it is proposed to commence with the experiments in entire trains fitted up with continuous brakes taken in order as may be most convenient to the railway companies.

It has been arranged, and the Commissioners have consented, to make experiments on the following trains, viz.:

London & Northwestern Railway Company, Clarke & Webb's brake.

Great Northern Railway Company, Smith's Vacuum Brake.

Midland Railway Company, Westinghouse Brake.

Caledonian Railway, Steele's Air Brake.

Northeastern Railway, Steele's Air Brake and engine wheels fitted with brakes.

The following experiments to be tried at speeds varying from 20 to 60 miles per hour, commencing with the two speeds of, say 30 miles and 60 miles per hour respectively.

On no account is either the steam to be shut off the engine, nor are the brakes to be applied before the signal is given.

Nor will the guards or driver be allowed to touch the brake handles or levers after starting the trains until the signal is given.

The order to stop will be given from the engine (by whistle), when both driver and guards will put on brakes, or by cord signal to guard.

No sand to be used except in the experiments directed.

In making the experiments having this object—the stopping in the shortest possible space—the amount of shock sustained in the act of stopping to be observed and measured as far as practicable.

First Series—With Complete Trains.—Stop by application of:

a. Tender brake and van brakes worked by hand.

b. Tender brake, van brake and continuous brake, applied by guards on whistle or cord signal.

c. Tender brake and continuous brake, applied by guards on whistle or cord signal, or engine brake (if any).

d. Tender brake and continuous brake, applied by driver and guards; and also engine brake (if any); using, in fact, all available means to stop, excepting sand-tubes.

e. As the last named (*d*), but using sand-boxes of engines and vans.

f. Rear guard to signal driver by cord to apply his section of continuous brake (or the whole).

g. As the last (*f*), but without guard signalling to driver.

h. Driver to shut off steam and apply continuous brake.

i. Driver to shut off steam and apply tender and engine brakes.

Second Series.—Stop Engine and Tender only:

a. By shutting off steam only.

b. By tender brake only—steam shut off.

c. Engine brake only—steam shut off.

d. Tender brake and engine brake.

e. Tender brake, and reversing.

Third Series.—Ascertain the Friction of the Trains of Carriages:

a. By running them down incline from a state of rest; or,

b. By observing retardation of motion over a given space, the train of carriages being detached from engine by slip coupling.

N. B.—Such variations from the above experiments to be made as the circumstances at the time may render desirable.

We copy the following description of the first day's trial from a letter by a special correspondent of the London *Railway News*. We hope to give a full account of the trials in next week's issue:

If you had wandered into the little station on the Midland Railway on Tuesday evening, you would have felt unmistakably impressed with the idea that something unusual was going on. Here and there small knots of gentlemen stood in earnest converse, the station-master flitted to and fro uneasily, porters ever and again swept imaginary dust from the platforms, stopping to gaze in silent admiration at the small knots of gentlemen, and turning again to sweep. Weatherbeaten signalmen unfurled bundles of flags with no other apparent object than to furl them up again. The fact was that Newark had been chosen as the head center for the scene of a series of the most important scientific operations upon which our great railway companies have ever conjointly engaged. The great question of continuous brakes—are they to be, or not to be?—has of late stirred the railway world to its inmost depths. Invention after invention has come to the fore, each with its powerful advocates animated by a curious admixture of philanthropy and commercial enterprise. While always receiving the sentiment with respect, long-headed managers have bided their time, trying all, but spending comparatively little money upon any. In so doing they have been wise in their generation; but this attitude could not be maintained for ever. Public spirit, private enterprise, awful railway accidents, like dropping waters, have worn away the legitimate rock of caution, and the time has come when the question, Which continuous brake shall we take? calls for speedy answer. Opportunely enough the Railway Commission now sitting desired to become posted up in the subject of brake power, and the Railway Association determined to invite the various companies belonging to their association, who are testing continuous brakes, to send trains fitted with such inventions as they might choose. In doing this the association were placing before railway men in an unmistakable form the merits and shortcomings of the several competitors' inventions so far as simple experiment could do this. They, however, kill two birds with one stone, for it is believed that out of the investigations and subsequent cogitations of the commission must come recommendation, and it has been thought that continuous brakes may be among these. The railway companies having continuous brakes on trial responded to an invitation to supply trains properly fitted with such brakes, and the Midland Company set apart as a course for the trials one side of their branch line between Nottingham and Lincoln. The distances were measured, levels taken, and every contrivance, mechanical and electrical, that science could devise was brought to bear, in order to arrive at accurate determinations of comparative merit. The measured ground is but a stone's throw from Newark, and Newark Station showed signs of disquietude on Tuesday evening last, because Wednesday morning was to see the commencement of the work, and during Tuesday brake trains from all parts had been doing preliminary canters over the course.

At ten o'clock on Wednesday morning the scene on the up line about 2¼ miles from Newark, on the Nottingham side, was one which railway men will not soon forget. Stretching away apparently in interminable line were a number of splendid specimens of what our great companies can turn out in the way of engines and passenger stock. Right away to the front was the London & North Western train, fitted with the powerful chain brake of Clarke & Webb. Next to this a train from the Caledonian Railway with Steele's McInnes' automatic reaction brake, by description replete with wondrous powers. Then we come to an engine and train brand new from end to end, sent by the London, Brighton & South Coast Company, a perfect pattern and fit, from an ornamental point of view, to run in a drawing-room. This train is fitted with the Westinghouse vacuum brake. After this comes perhaps the grandest train of the lot, sent by the great Northern Company. Its magnificent coaches are all six-wheelers, its total weight is some 80 tons greater, and the over-all length is more than that of any other train on the ground, though, of course, it has only 15, the regulation number of coaches. This train is the subject of much attention and speculation, and it was fitted with Smith's vacuum brake, which has won its way into the affections of so many of our great railway engineers. The Midland Company has gone wholesale into the experimental business, and sends to the ground four trains with brakes by Westinghouse, Clarke, Barker and Kitson. The Lancashire & Yorkshire sends Foy's brake, and the Caledonian Railway Steele's air-brake. The North Eastern sends an engine with the vacuum.

Standing by each train are the brake inventors and their assistants anxiously awaiting the arrival of the big guns, who will assume command of trains, brakes, and the whole paraphernalia. Shortly after ten o'clock a train dashes up to the course on the down line, and the business of the first day commences at once. It consisted of running the whole of the trains over the course and stopping by means of the old hand brake. This was interesting principally for giving reliable comparisons between this method of stop and by continuous brakes, which were then tried by application from tender brake and van brake, and put on by guards on flag or cord signal. The following table will do enough to determine in favor of continuous brakes of some kind:

TENDER BRAKES AND VAN BRAKES WORKED BY HAND.

Company.	Speed miles per hour.	Train ran after brake applied. Feet.	Stopped in secs.
London & North Western	47	2,389	62.5
Caledonian	47	3,005	80
London, Brighton & South Coast	49	3,705	95
Great Northern	47½	3,591	86
Midland	47	3,265	82

TENDER BRAKES, VAN BRAKES, AND CONTINUOUS BRAKE, APPLIED BY GUARDS ON FLAG OR CORD SIGNAL.

Brake.			
Clarke & Webb's—Lon. & N. W.	50	1,384	32
Steele's Air Brake—Caledonian	49	2,135	45
Westinghouse vacuum—L. B. & S. C.	50½	2,200	45
Fay's Brake—Lancashire & Yorkshire	48½	1,016	24
Smith's Vacuum Brake—Great Northern	46	1,200	26

The trials proceeded Thursday with severe tests, but the results are not known officially, and the commissioners are anxious that no unofficial figures should be published. The trials will last certainly several more days, and the programme will be slightly altered.

LOCOMOTIVE RETURNS, FEBRUARY, 1875.

Master Mechanics of all American railroads are invited to send us their monthly reports for this table.

Name of Road.	Number of miles operated	Number of Locomotives in service	Mileage. Total	Mileage. Average per Engine	No. Miles run to Ton of Coal	No. Miles run to Cord of Wood	No. Miles run to Pint of Oil	Average No. of freight cars hauled	Cost per Mile in Cents for Repairs	Fuel	Stores	Miscellaneous	Engine'rs, firemen and wipers	Total	Av'ge cost of Coal, per ton or bushel	Av'ge cost of Wood, per cord
Allegheny Valley	259	60	103,516	1,725	34.80	.....	17.95	.....	5.78	4.33	0.97	.....	7.89	18.97	$1.35	$2.70
Atlantic & Great West'n (First & Second Div.)	228	80	176 617	2,208	38.91	.....	19.41	.....	4.60	6.05	0.53	0.92	6.43	18.53	2.19	3.24
" " (Third & Fourth Div.	197	48	102 193	2,129	38.91	.....	20.72	.....	4.91	6.05	0.44	1.14	6.03	18.57	2.19	3.24
" " (Mahoning Division)	121	58	97,170	1,675	38.91	.....	18.19	.....	4.32	6.05	0.52	0.75	6.11	17.75	2.19	3.24
Camden & Atlantic*	67	11	14,266	1,297	67.85	.....	21 50	.....	18.62	7.28	0.74	.....	6.36	33.00	4.93	.....
Central Pacific (Western Division)	173 4	44	102,369	2,327	42.99	.....	18.11	.....	7.43	18.55	0.75	0 64	8.14	35.51	8.00	5.05
" " (Sacramento Division)	119.5	37	75,582	2,043	...	29.31	15.31	.....	12.61	17.23	0.87	0.94	8.95	40.60	.....	5.05
" " (Truckee Division)	204.5	27	54,603	2.022	37.88	28.56	15.29	.....	14.03	19.52	0.76	0.92	8.98	44.21	8.00	5.05
" " (Humboldt Division)	236.6	22	54,187	2.463	41.87	.....	16.86	.....	5.52	19.05	0.70	0.58	8.08	33.93	8.00	5.05
" " (Salt Lake Division)	182.8	21	53,997	2 571	37.58	.....	18.79	.....	12.80	21.23	0.66	0.61	8.05	43.35	8 00	5.05
" " Oregon Division)	151.42	7	20,646	2 949	.....	41.37	22.01	.....	2.57	12.21	0.65	0.70	7.89	24 02	.....	5.05
" " (Vacaila Division)	188.3	13	29.522	2.271	55.45	50.19	16.90	.....	7.57	13.98	0.77	0.06	6.76	29.14	8.00	5.05
Chicago, Burlington & Quincy (Aurora Div.)†	.....	163	196,757	1.910	....	.....	.....	18.08	.....	.....	.....	.....	.....	36.36	2.50	4.25
" " " (Galesb'g Div.)†	.....	90	193 845	2,154	....	.....	.....	15.2-	.....	.....	.....	.....	.....	28.58	2.50	4.25
" " " (Burl'gt'nDiv.)†	.....	38	83,945	2,209	....	.....	.....	14 53	.....	.....	.....	.....	.....	24.88	2 50	4.25
" " " (Creston Div.)†	.....	71	169,003	2,380	....	.....	.....	8.50	.....	.....	.....	.....	.....	22.26	2.50	4.25
Chicago, Rock Island & Pacific (Illinois Div.)	.....	...	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " (Iowa Division)	.....	...	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " (Southwestn Div.)	.....	...	.....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleve., Col., Cin. & Ind. (Columbus Div.)	138	56	119,198	2,131	40.56	56.35	36.07	.....	4.35	6.49	0.57	.....	5.97	18.38	2 42	3.80
" " " (Indianapolis Div.)	207	63	165,518	2.627	41.07	41.95	26.53	.....	5.08	5.79	0 59	.....	6.65	18.11	2.00	3.80
" " " (Cincinnati Div.)	130	27	64,214	2,378	37.23	.....	29.38	.....	2.99	5.88	0.51	.....	7.27	16.65	2.00	3.80
Cleveland & Pittsburgh	199	76	125.508	1.651	47.80	.....	17.47	.....	7.51	4.11	0.74	3.08	7.24	22.68	1.70	1.96
Del., Lacka. & West. (Bloomsburg Div.)	80	21	40,540	1,930	....	.....	25.79	.....	6.92	.....	0.80	.....	7.10	14.82	.....	4.80
Flint & Pere Marquette	289.	...	95,531	.....	.....	44.29	24.96	.....	4.08	10.16	0.55	.....	6.48	31.27	.....	4.00
Hannibal & St. Joseph	294	55	92 989	1,691	39.30	.....	18 00	.....	7.40	7.40	0.50	.....	7.40	22.70	2.75	4.25
Illinois Central (Chicago Div.)	262.5	67	155,107	2,315	34.85	.....	13.92	13.96	5.43	5.47	0.36	.....	6.83	18.11	1.80	4.25
" " (South Div.)	230.75	35	100,522	2,872	31.96	.....	13.21	14.93	6.08	5.92	0.41	.....	6.51	18.92	1.80	4.25
" " (North Div.)	275	44	109.523	2,489	29. 9	.....	13.24	11.61	8.57	6.53	0.39	.....	6.89	22.38	1.80	4.25
" " (Iowa Div.)	401	44	96.879	2,202	33.61	.....	17.88	8.64	7.29	7.12	0.32	.....	7.54	22.27	2.30	4.75
Jeffersonville, Madison & Indianapolis	225	42	87,859	2,092	34.00	30.53	16.00	.....	3.52	8.52	0.50	2.86	6.77	22.17	2.85	2.00
Kansas Pacific, Main Line	673	86	118 938	1,383	27.74	.....	11.68	.....	7.06	12.66	0.52	.....	7.66	27.90	3.50	2.65
" including branches	895	94	135,550	1,442	28.46	.....	11.85	.....	6.38	12.78	0.51	.....	7.70	27.37	3.62	2.99
Kansas City, St. Joseph & Council Bluffs†	253	24	58 067	2.419	41.80	.....	27.60	18.70	5.80	8.30	0.60	.....	7.70	22.40	3.15	4.00
Lake Shore & Mich. South. Buffalo Div.)‡	.....	93	179.929	1,935	40.31	44.46	16.66	.....	4.82	8.67	.....	.....	6.57	20.06	3.70	3.50
" " (Erie Div.)‡	.....	114	212,198	1,861	37.75	59 98	19.64	.....	6.48	9.30	.....	.....	6.54	22.42	3.50	4.00
" " (Toledo Div.)‡	.....	79	158,981	2.012	31.20	45.95	14.03	.....	6.83	12.26	.....	.....	5.34	25.43	4.00	4.00
" " (Mich.South.Div.)‡	.....	210	438,318	2,087	40.48	54 79	20.11	.....	4.27	9.43	.....	.....	7.13	20.83	4.50	3.50
Leavenworth, Lawrence & Galveston	203.7	18	18,781	1.043	61.10	.....	26.90	.....	5.10	6.30	0.34	.....	5.80	17.54	3.63	3.80
Marquette, Houghton & Ontonagon	.....	30	13,891	463	44.12	.....	23.00	.....	6.91	16.30	0.99	.....	10.51	34.71	.....	.....
Northern Central (Elmira & Canandaigua Div.)	.....	42	61.420	1,462	27.93	.....	17.24	.....	7.50	8.79	0.83	.....	6.21	23,33	0.08	3.04
Pennsylvania (New York Division)	119.9	117	248,683	2,128	30,93	.....	9.11	.....	6.50	14 80	1.40	.....	.....	22.70	0.16	6.88
" (Amboy Division)	154.2	47	72.897	1,551	47.74	.....	14.88	.....	4.60	9.50	0.90	.....	.....	15.00	0.16	6.92
" (Belvidere Division)	102.5	27	45,558	1,687	44.65	.....	12.88	.....	4.50	10.20	1.20	.....	.....	15.90	0.16	6.90
" (Philadelphia Division)	204.3	155	347,47-	2.242	31.55	.....	13.66	.....	3.90	5.60	0.80	.....	.....	10,30	0.06	3.52
" (Middle Division)	131.6	128	291,462	2,277	28.95	.....	20.24	.....	3.40	6.10	0.60	.....	.....	10,10	0.06	3.52
" (Pittsburgh Division, East End)	.....	69	131.885	1,911	20.76	.....	12.13	.....	4.80	8.40	1.00	.....	.....	14.20	0.06	3.52
" (Pittsburgh Division, West End)	.....	103	228.178	2,215	32.43	.....	13.09	.....	8.50	5.40	0.80	.....	.....	14.70	0.06	3.52
" (Tyrone Division)	106.8	23	46,572	2.025	24.26	.....	23.15	.....	9.50	7.20	0.60	.....	.....	17.30	0.06	3.52
" (West Pennsylvania Division)	103.6	24	39,491	1.645	40.82	.....	28.90	.....	4.40	4.50	0.40	.....	.....	9.30	0.06	3.52
" (Lewistown Division)	12.5	3	3,059	1,020	43.68	.....	19.61	.....	1.80	4.80	0.50	.....	.....	7.10	0.06	3.57
" (Bedford Division)	56.5	6	8,387	1,398	53.04	.....	27.62	.....	1.80	3.50	0.40	.....	.....	5 70	0.06	3.54
Pitts., Fort Wayne & Chicago (Eastern Div.)‖	468.9	177	375,262	2,120	35.62	.....	14.53	11.80	4.07	4.67	0.92	1.10	6.48	17 24	1.66	1.66
" " " (Western Div.)	280	108	278,959	2,583	37,70	.....	13.65	15,80	4.30	6.40	0.60	1.60	6.50	19.40	2.40	2.40
Pitts., Cin. & St. Louis (Little Miami Div.)	.....	37	91,353	2,469	42.60	.....	11.32	.....	5.47	4.38	1.08	3.52	7.08	21.53	1.75	2.77
" " (Pittsb. & Col. Div.)	.....	92	232,460	2,527	27.11	.....	13.36	11.05	6.35	5.45	0.97	2.30	6.97	22.04	1 40	3.80
Stockton & Copperopolis	49	3	3 520	1,173	....	63.14	15,86	.....	3.69	7.92	0.89	1.07	9.67	23.24	.....	5.00
South Carolina	242	39	73,111	1,875	.....	42.53	28.13	.....	5.84	6.01	0.75	.....	.....	12.60	.....	2.50
Terre Haute & Indianapolis (Indianap. Div.)	112.63	....	62,593	.....	28,10	.....	19.60	.....	6.70	6.80	0.91	.....	8.11	22.52	1.91	.....
" " (Vandalia Div.)	158.30	....	66,312	.....	30.20	.....	21.80	.....	7.09	4.68	1.01	.....	8.44	21.13	1.41	.....

†Three empty cars rated as two loaded ones.
*One new boiler complete included in repairs.
‡Switching engines allowed 6 miles per hour.
‖Two empty cars counted as one loaded one.